

BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07



Certificate #6613.01

FCC TEST REPORT

(Part 15, Subpart C)

Applicant:	SHARP CORPORATION
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

Manufacturer or Supplier:	SHARP CORPORATION
Address:	1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan
Product:	Smart Phone
Brand Name:	SHARP
FCC ID:	APYHRO00336
Date of tests:	Mar. 19, 2025 ~ Apr.28, 2025

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 15, Subpart C, Section 15.247**

☒ **ANSI C63.10-2020**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Hanwen Xu Engineer / Mobile Department	Approved by Peibo Sun Manager / Mobile Department
	
Date: Apr.28, 2025	Date: Apr.28, 2025

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Test Report No.: PSU-NQN2504150110RF07

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2504150110RF07	Original release	Apr.28, 2025



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
15.207	AC Power Conducted Emission	Compliance
15.205 15.209	Radiated Emissions	Compliance
15.247(d)	Out of band Emission Measurement	Compliance
15.247(a)(2)	6dB bandwidth	Compliance
15.247(b)	Conducted Output power	Compliance
15.247(e)	Power Spectral Density	Compliance
15.203	Antenna Requirement	Compliance

Note : 1.Except RSE, other data please refer to Appendix 1 (for WIFI-2.4G) and Appendix 2 (for BLE).

*Test Lab Information Reference

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.

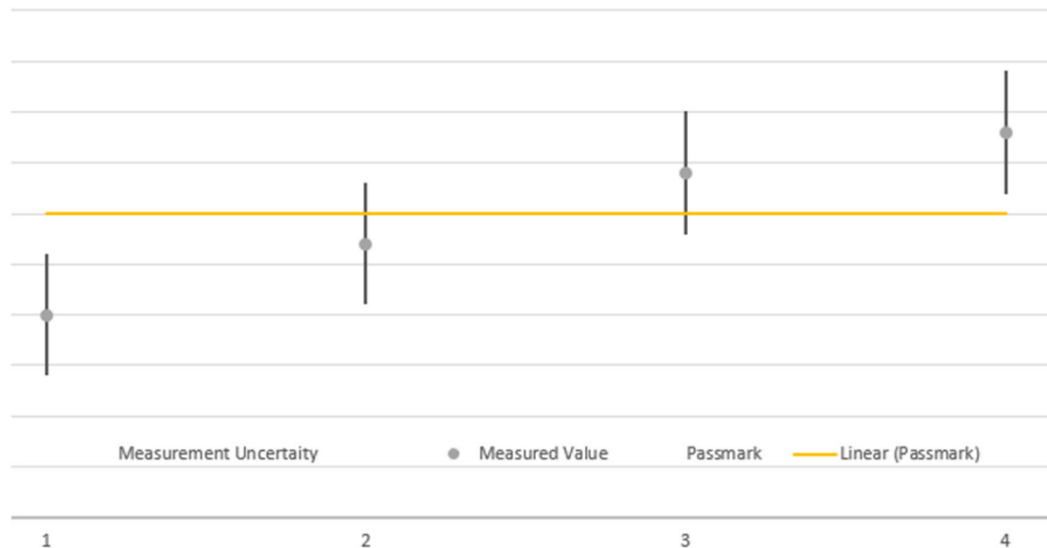


1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
AC Power Conducted emissions	$\pm 2.70\text{dB}$
Radiated emissions (9KHz~30MHz)	$\pm 2.68\text{dB}$
Radiated emissions (30MHz~1GHz)	$\pm 4.98\text{dB}$
Radiated emissions (1GHz ~6GHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GHz ~18GHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GHz ~40GHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Power Spectral Density	$\pm 0.85\text{ dB}$

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.



The verdicts in this test report are given according the above diagram:

Case	Measured Value	Uncertainty Range	Verdict
1	below pass mark	below pass mark	Passed
2	below pass mark	within pass mark	Passed
3	above pass mark	within pass mark	Failed
4	above pass mark	above pass mark	Failed

That means, the laboratory applies, as decision rule (see ISO/IEC 17025:2017), the so-called shared risk principle.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT*	Smart Phone
BRAND NAME*	SHARP
NOMINAL VOLTAGE*	4.0Vdc(adapter or host equipment) 3.89Vdc (Li-ion, battery)
MODULATION *	DSSS, OFDM, GFSK, OFDMA
TRANSMISSION RATE	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 400 Mbps 802.11ax: up to 688.2 Mbps 802.11be: up to 688.2 Mbps
OPERATING FREQUENCY	2412-2462MHz for 11b/g/n(HT20/40)/ax(HE20/40)/be(EHT20/40) 2402-2480MHz for BT-LE(GFSK)
Resource Unit (RU)	Single RU: 26-tone, 52-tone,106-tone,242-tone,484-tone, 996-tone,2*996-tone Multi-RU (Small RU):52-tone + 26-tone, 106-tone + 26-tone Multi-RU (Large RU):484-tone + 242-tone
MAX. OUTPUT POWER	BT-LE: 5.21mW (Maximum) WLAN: 205.12mW (Maximum) RU WLAN: 302mW (Maximum)
ANTENNA TYPE*	ANT4: PIFA Antenna with -3.2dBi gain ANT8: PIFA Antenna with 0.4dBi gain
HW Version*	DVT
SW Version*	A2270
I/O PORTS*	Refer to user's manual
EXTREME TEMPERATURE*	5~35°C
EXTREME VOLTAGE*	3.7V~4V

**NOTE:**

1. *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, Test Lab is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.
2. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
3. The EUT incorporates a MIMO function. Physically, the EUT provides two transmitter and two receiver.

MODULATION MODE	TX/RX FUNCTION
802.11b	2TX /2RX
802.11g	2TX /2RX
802.11n(HT20)/ax(HE20)	2TX /2RX
802.11n(HT40)/ax(HE40)	2TX /2RX
802.11ax (20MHz RU 26/52/106/242)	2TX /2RX
802.11ax (40MHz RU 26/52/106/242/484)	2TX /2RX
802.11be(EHT20)	2TX /2RX
802.11be(EHT40)	2TX /2RX
802.11be(20MHz RU 26/52/106/242 MRU52+26/106+26)	2TX /2RX
802.11be(40MHz RU 26/52/106/242/484 MRU52+26/106+26/484+242)	2TX /2RX
BT_LE(1MHz)	2TX /2RX
BT_LE(2MHz)	2TX /2RX
BT_LE(S2)	2TX /2RX
BT_LE(S8)	2TX /2RX

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
5. Antenna gain and EUT conducted cable loss are provided by the customer, and the laboratory will record the results based on these items that involve these two parameters.



6. List of Accessory:

Battery Information	Battery Type	Li-Lon
	Manufacturer	Ningde Amperex Technology Limited
	Model Number	UBATIA319AFN2
	Capacity	4880 mAh
	Nominal Voltage	3.89V



2.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20), 802.11ax20 (HE20), 802.11be20 (EHT20); 802.11ax/be20 (RU 26/52/106/242) (MRU52+26/106+26):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

7 channels are provided for 802.11n (HT40), 802.11ax40 (HE40); 802.11be40 (EHT40); 802.11ax/be40 (RU RU 26/52/106/242/484) (MRU52+26/106+26/484-tone + 242-tone):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

40 channels are provided for BT-LE (GFSK):

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480



2.2.1 CONFIGURATION OF SYSTEM UNDER TEST

Please see section 4 photographs of the test configuration for reference.

2.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports.

The worst case was found when positioned on Y axis for radiated emission. Following test modes were selected for the final test, and the final worst case is marked in boldface and recorded in the report:

EUT CONFIGURE MODE	APPLICABLE TO				MODE
	RE<1G	RE≥1G	PLC	APCM	
-	√	√	√	√	-

Where **RE<1G**: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: No need to concern of Conducted Emission due to the EUT is powered by battery.

RADIATED EMISSION TEST (BELOW 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
BT-LE	0 to 39	39	GFSK	0.125

**RADIATED EMISSION TEST (ABOVE 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11ax HE20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0
802.11ax HE40	3 to 9	3,6,9	OFDM	MCS0
802.11ax 20 (RU 26/52/106/242)	1 to 11	1, 6, 11	OFDMA	MCS0
802.11ax 40 (RU 26/52/106/242/484)	3 to 9	3,6,9	OFDMA	MCS0
802.11be(EHT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11be(EHT40)	3 to 9	3,6,9	OFDM	MCS0
802.11be(20MHz RU 26/52/106/242 MRU52+26/106+26)	1 to 11	1, 6, 11	OFDMA	MCS0
802.11be(40MHz RU 26/52/106/242/484 MRU52+26/106+26/48+4+242)	3 to 9	3,6,9	OFDMA	MCS0
BT-LE	0 to 39	0,19, 39	GFSK	0.125&0.5&1.0
BT-LE	1 to 38	1,19, 38	GFSK	2.0

**POWER LINE CONDUCTED EMISSION TEST**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11ax 20	1 to 11	1, 11	OFDMA	MCS0

BANDEDGE MEASUREMENT:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11ax HE20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0
802.11ax 20 (RU 26/52/106/242)	1 to 11	1,11	OFDMA	MCS0
802.11ax 40 (RU 26/52/106/242/484)	3 to 9	3,9	OFDMA	MCS0
802.11be(EHT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11be(EHT40)	3 to 9	3,6,9	OFDM	MCS0
802.11be(20MHz RU 26/52/106/242 MRU52+26/106+26)	1 to 11	1, 6, 11	OFDMA	MCS0
802.11be(40MHz RU 26/52/106/242/484 MRU52+26/106+26/484+242)	3 to 9	3,6,9	OFDMA	MCS0
BT-LE	0 to 39	0,19, 39	GFSK	0.125&0.5&1.0
BT-LE	1 to 38	1,19, 38	GFSK	2.0

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ The following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1.0
802.11g	1 to 11	1, 6, 11	OFDM	6.0
802.11n HT20	1 to 11	1, 6, 11	OFDM	MCS0
802.11ax HE20	1 to 11	1, 6, 11	OFDM	MCS0
802.11n HT40	3 to 9	3,6,9	OFDM	MCS0
802.11ax HE40	3 to 9	3,6,9	OFDM	MCS0
802.11ax 20 (RU 26/52/106/242)	1 to 11	1,11	OFDMA	MCS0
802.11ax 40 (RU26/52/106/242/484)	3 to 9	3,9	OFDMA	MCS0
802.11be(EHT20)	1 to 11	1, 6, 11	OFDM	MCS0
802.11be(EHT40)	3 to 9	3,6,9	OFDM	MCS0
802.11be(20MHz RU 26/52/106/242 MRU52+26/106+26)	1 to 11	1, 6, 11	OFDMA	MCS0
802.11be(40MHz RU 26/52/106/242/484 MRU52+26/106+26/484+242)	3 to 9	3,6,9	OFDMA	MCS0
BT-LE	0 to 39	0,19, 39	GFSK	0.125&0.5&1.0
BT-LE	1 to 38	1,19, 38	GFSK	2.0

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE	TESTED BY
RE<1G	23deg. C, 70%RH	DC 4V By DC Supply	Hanwen Xu
RE≥1G	23deg. C, 70%RH	DC 4V By DC Supply	Hanwen Xu
PLC	25deg. C, 52%RH	DC 4V By DC Supply	Hanwen Xu
APCM	25deg. C, 60%RH	DC 3.7V By DC Supply	Hanwen Xu

2.3 DUTY CYCLE OF TEST SIGNAL

Please Refer to Appendix1/2 Of this test report.

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C, Section 15.247

KDB 558074 D01 DTS Meas Guidance v05r02

ANSI C63.10-2020

Note :

1. All test items have been performed and recorded as per the above standards.
2. The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (Certification). The test report has been issued separately.



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Laptop	Lenovo	Thinkpad E14	SL10W47313	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 1.5m
2	AC Line: Unshielded, Detachable 1.5m
3	AC Line: Unshielded, Detachable 1.5m



3 TEST TYPES AND RESULTS

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	102749	Mar.28,24	Mar.27,26
ELEKTRA test software	Rohde&Schwarz	ELEKTRA	NA	N/A	N/A
LISN network	Rohde&Schwarz	ENV216	102640	Mar.28,24	Mar.27,26
CABLE	Rohde&Schwarz	W61.01	N/A	Apr.27,25	Apr.26,26
CABLE	Rohde&Schwarz	W601	N/A	Apr.27,25	Apr.26,26

NOTE:

1. The test was performed in CE shielded room.
2. The calibration interval of the above test instruments is 12 /24months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.



3.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

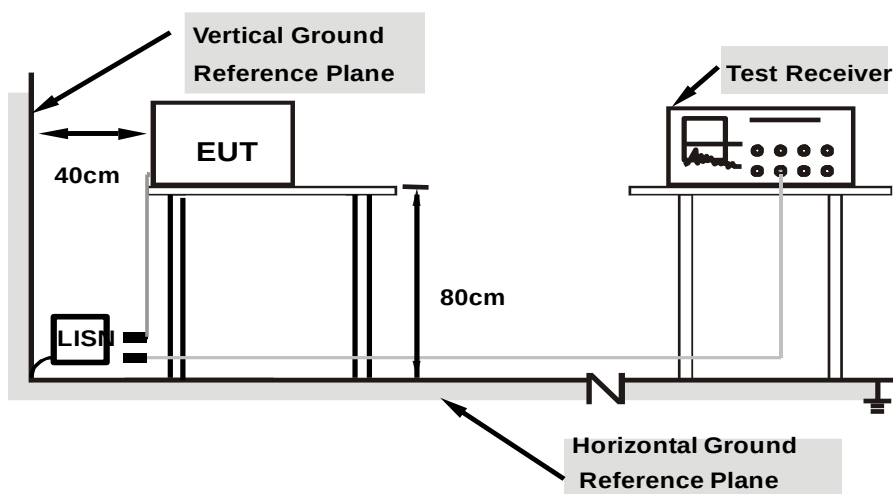
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation.



3.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80
from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.6 EUT OPERATING CONDITIONS

- Turned on the power and connected of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.



3.1.7 TEST RESULTS

BLE

AC Power line Conducted Emission

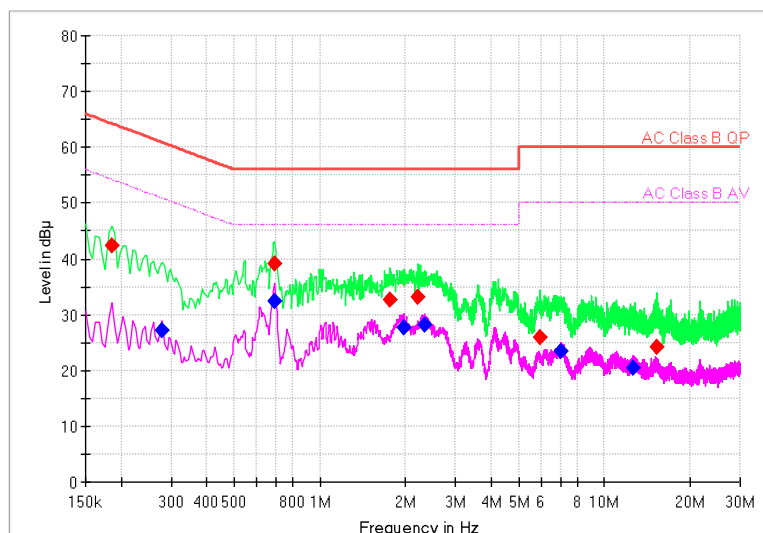
A “reference path loss” Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of “reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(42.37\text{dB}\mu\text{V}) = (12.77\text{dB}\mu\text{V}) + (29.6\text{dB})$, the corresponding frequency is 0.15MHz.

Full Spectrum



L+N Line



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MEASUREMENT RESULT:

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	PmeaQuasiPeak (dBμV)	PmeaAverage (dBμV)
0.185118	42.37	---	64.25	21.88	L1	29.6	12.77	---
0.277301	---	27.18	50.9	23.71	L1	29.6	---	-2.42
0.689934	---	32.49	46	13.51	L1	29.6	---	2.89
0.689934	39.14	---	56	16.86	L1	29.6	9.54	---
1.765412	32.68	---	56	23.32	L1	29.6	3.08	---
1.976118	---	27.59	46	18.41	L1	29.6	---	-2.01
2.217551	33.24	---	56	22.76	L1	29.6	3.64	---
2.322904	---	28.28	46	17.72	L1	29.6	---	-1.32
5.948801	25.81	---	60	34.19	L1	29.7	-3.89	---
7.002331	---	23.49	50	26.51	L1	29.7	---	-6.21
12.68261	---	20.42	50	29.58	L1	29.9	---	-9.48
15.34716	24.11	---	60	35.89	L1	30	-5.89	---



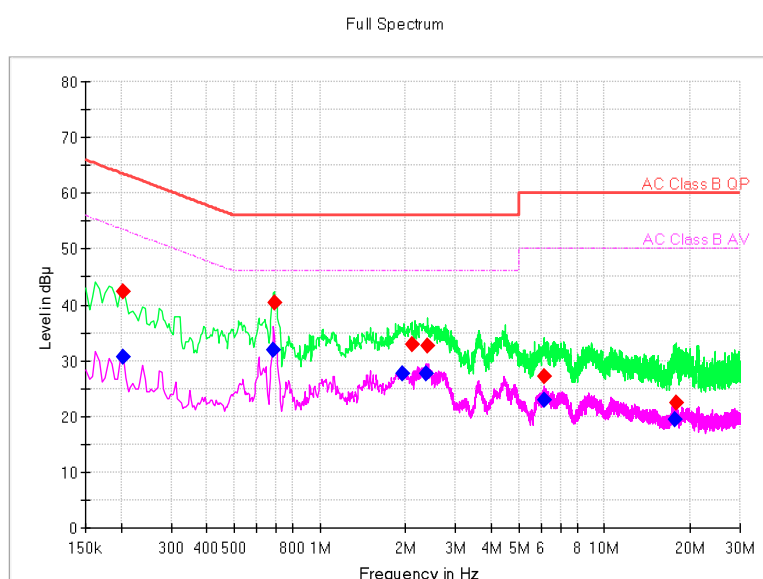
WIFI

A “reference path loss” Corr.(dB) is established and the $L_{\text{cable}} + \text{ATT} + \text{VDF}$ is the attenuation of “reference path loss”, and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{\text{result}} = P_{\text{mea}} + \text{Corr. (dB)}$$

Sample calculation: $(39.6\text{dB}\mu\text{V}) = (10\text{dB}\mu\text{V}) + (29.6\text{dB})$, the corresponding frequency is 0.15MHz.



L+N Line



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

MEASUREMENT RESULT:

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Line	Corr. (dB)	PmeaQuasiPeak (dBμV)	PmeaAverage (dBμV)
0.202676	---	30.71	53.5	22.79	L1	29.6	---	1.11
0.202676	42.34	---	63.5	21.16	L1	29.6	12.74	---
0.685544	---	31.96	46	14.04	L1	29.6	---	2.36
0.689934	40.29	---	56	15.71	L1	29.6	10.69	---
1.949779	---	27.62	46	18.38	L1	29.6	---	-1.98
2.116588	32.93	---	56	23.07	L1	29.6	3.33	---
2.358022	---	27.76	46	18.24	L1	29.6	---	-1.84
2.38436	32.53	---	56	23.47	L1	29.6	2.93	---
6.12439	---	22.84	50	27.16	L1	29.7	---	-6.86
6.128779	27.22	---	60	32.78	L1	29.7	-2.48	---
17.75272	---	19.53	50	30.47	L1	30.2	---	-10.67
17.86246	22.37	---	60	37.63	L1	30.2	-7.83	---



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



3.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,23	Aug.29,25
Pre-Amplifier	R&S	SCU08F1	101028	Jan.22,24	Jan.21,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,23	Aug.21,25
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,23	Aug.21,25
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.23,25	Feb.22,27
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	N/A	N/A
DC Source	HYELEC	HY3010B	551016	Aug.31,23	Aug.30,25
Hygrothermograph	DELI	20210528	SZ014	Sep.06,23	Sep.05,25
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,25	Apr.26,26
CABLE	R&S	W12.14	N/A	Apr.27,25	Apr.26,26

- NOTE:**
1. The calibration interval of the above test instruments is 12/ 24/ 36 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Chamber.
 3. The FCC Site Registration No. is 434559; The Designation No. is CN1325.



3.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be perform using fresh batteries. The turntable was rotated to maximize the emission level.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

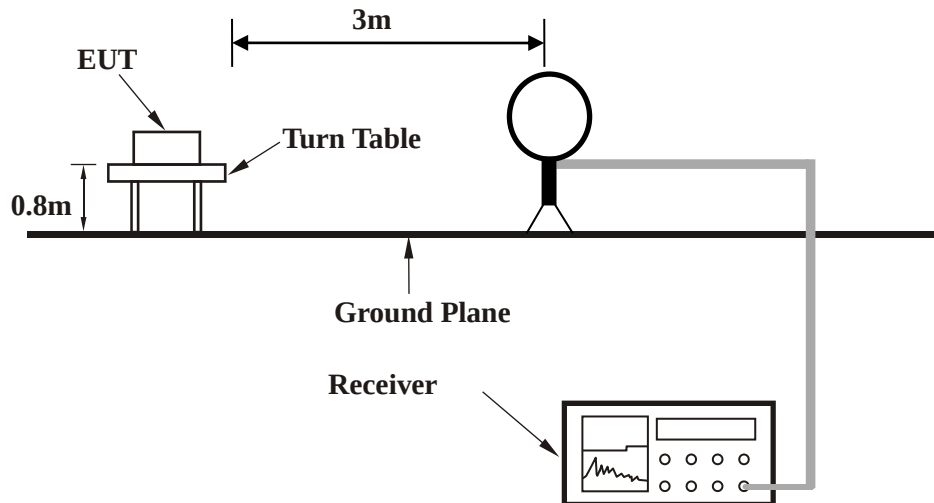
3.2.4 DEVIATION FROM TEST STANDARD

No deviation

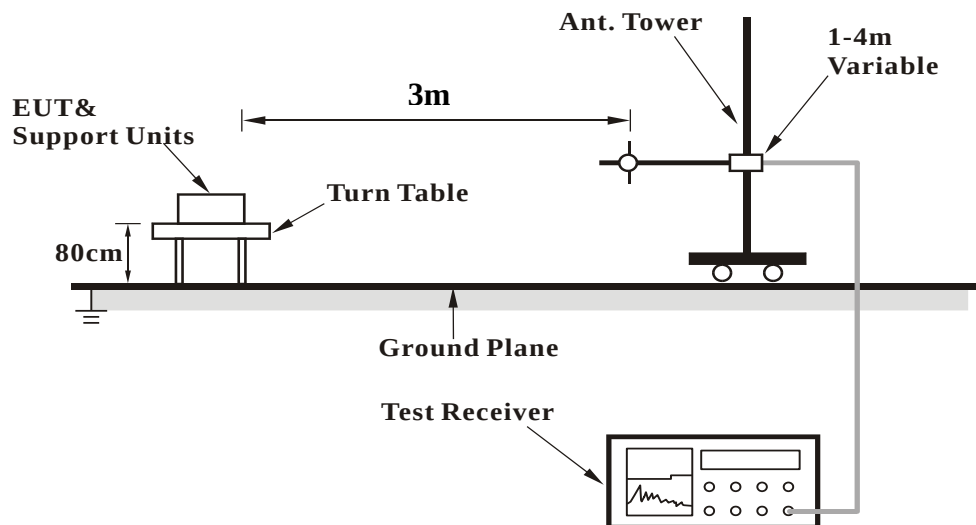


3.2.5 TEST SETUP

<Frequency Range 9KHz~30MHz >

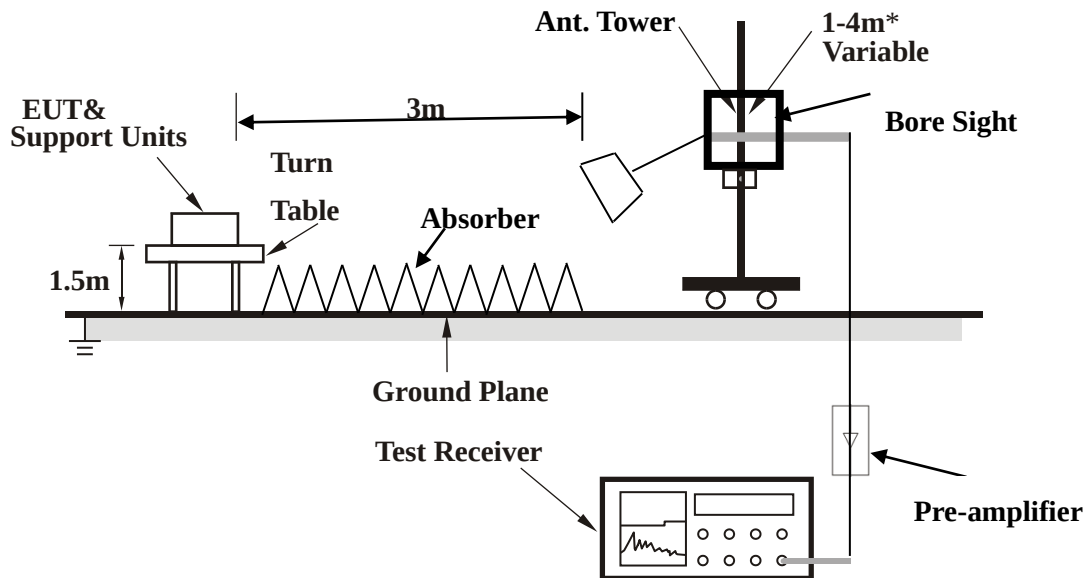


< Frequency Range 30MHz~1GHz >





<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.2.6 EUT OPERATING CONDITIONS

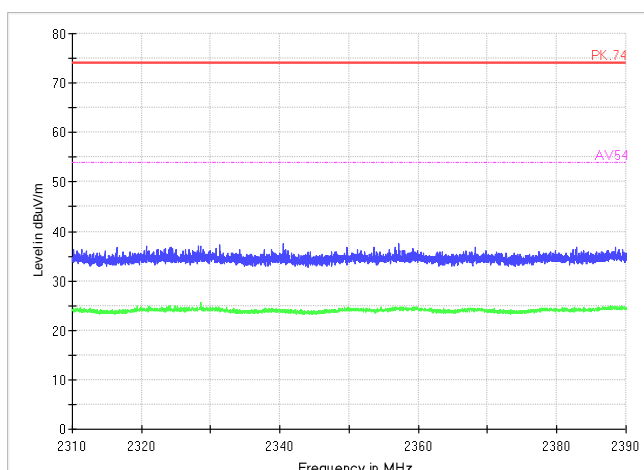
- Set the EUT under full load condition and placed them on a testing table.
- Set the transmitter part of EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the EUT in full functions.



3.2.7 TEST RESULTS

NOTE1 : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Radiated Emission Band Edge for BLE

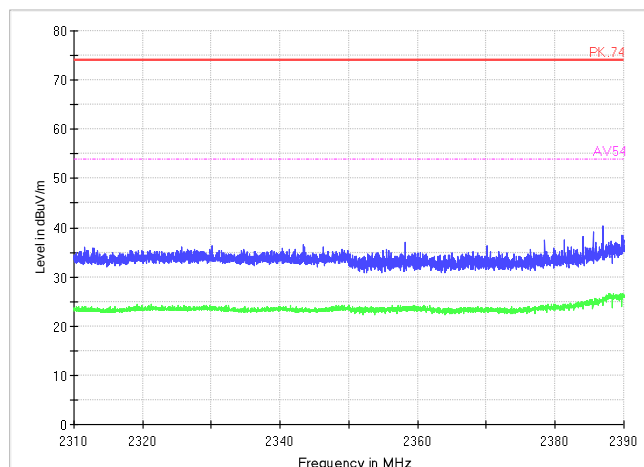


Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 1Mbps)

Polarity: Vertical



Carrier frequency (MHz): 2402

Channel No.:0

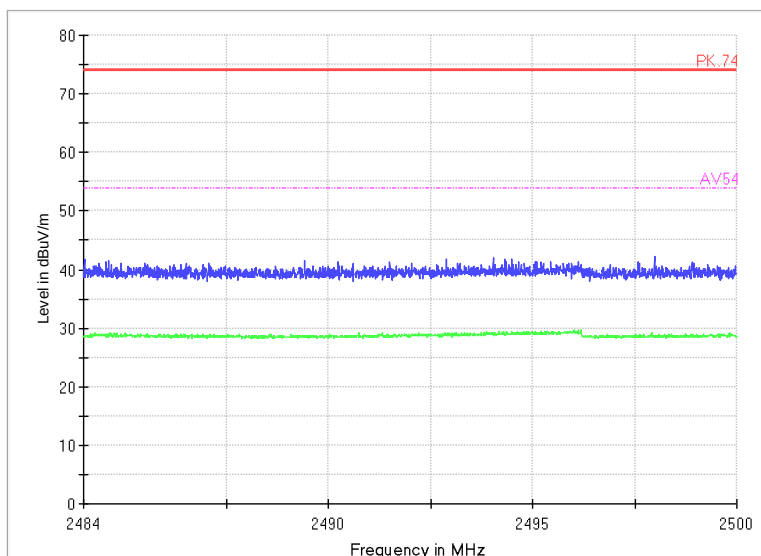
Test Mode: GFSK (LE 1Mbps)

Polarity: Horizontal



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Test Report No.: PSU-NQN2504150110RF07

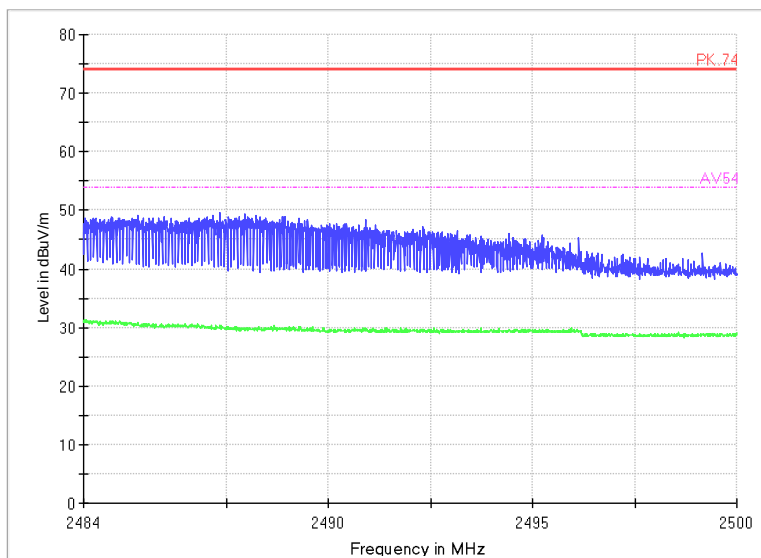


Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE 1Mbps)

Polarity: Vertical



Carrier frequency (MHz): 2480

Channel No.:39

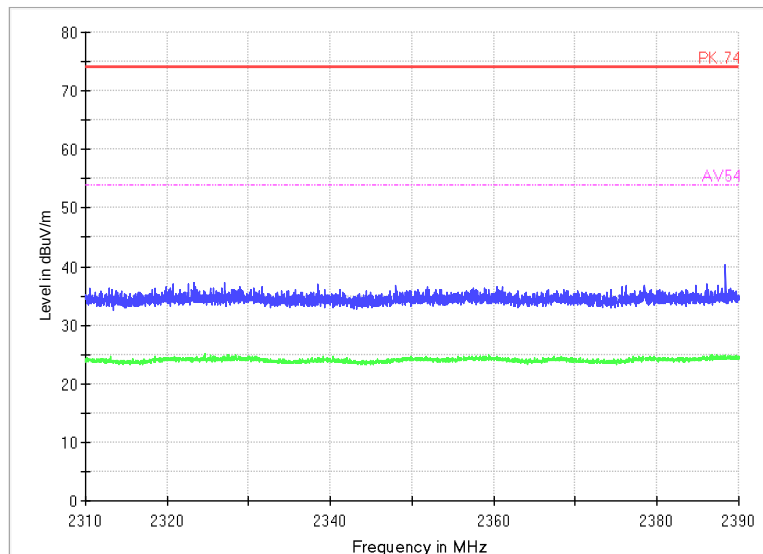
Test Mode: GFSK (LE 1Mbps)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

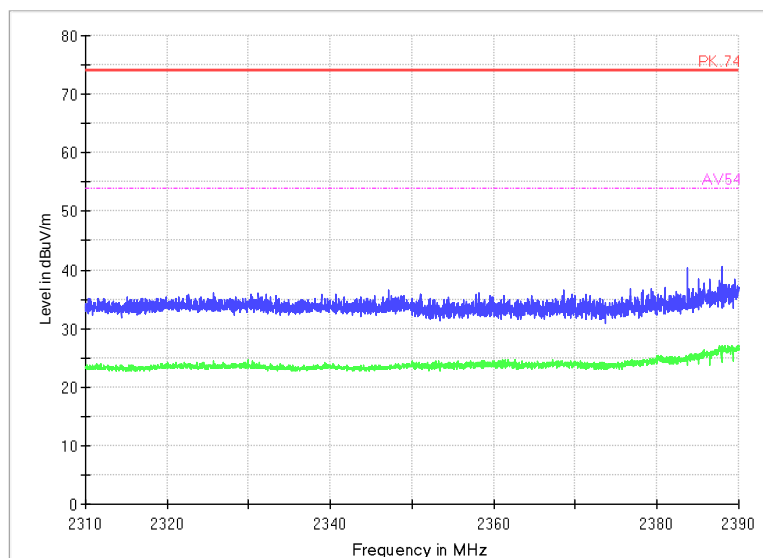


Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 2Mbps)

Polarity: Vertical



Carrier frequency (MHz): 2402

Channel No.:0

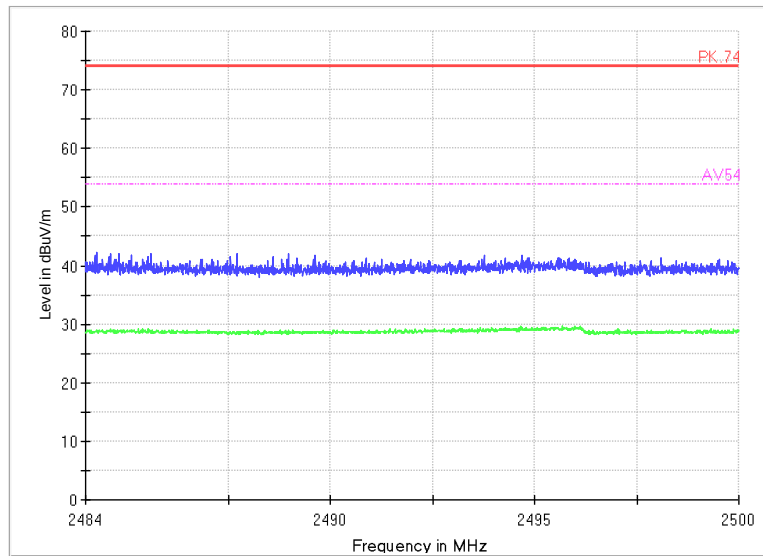
Test Mode: GFSK (LE 2Mbps)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

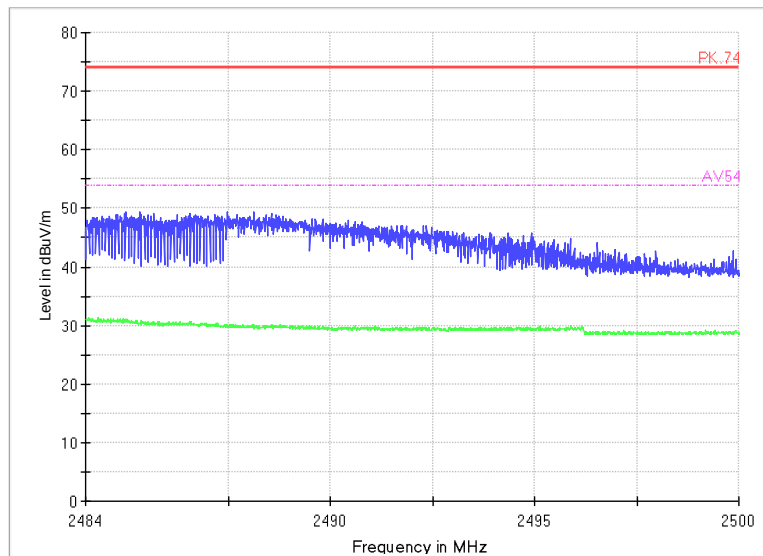


Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE 2Mbps)

Polarity: Vertical



Carrier frequency (MHz): 2480

Channel No.:39

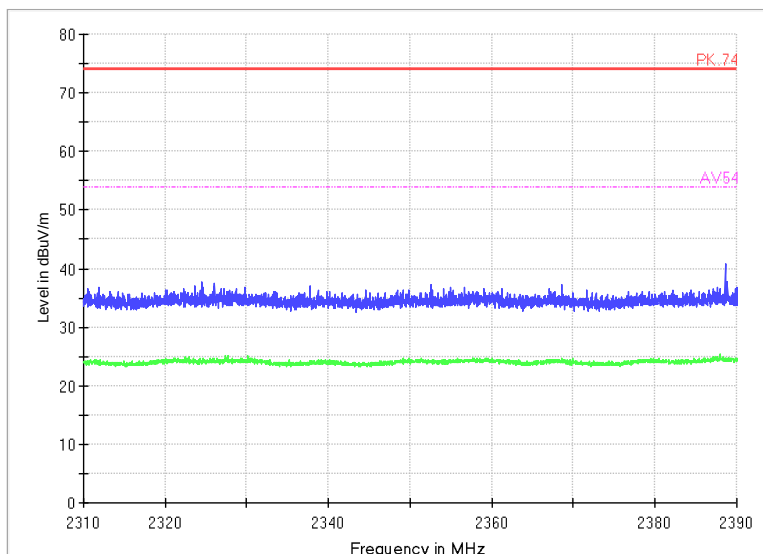
Test Mode: GFSK (LE 2Mbps)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

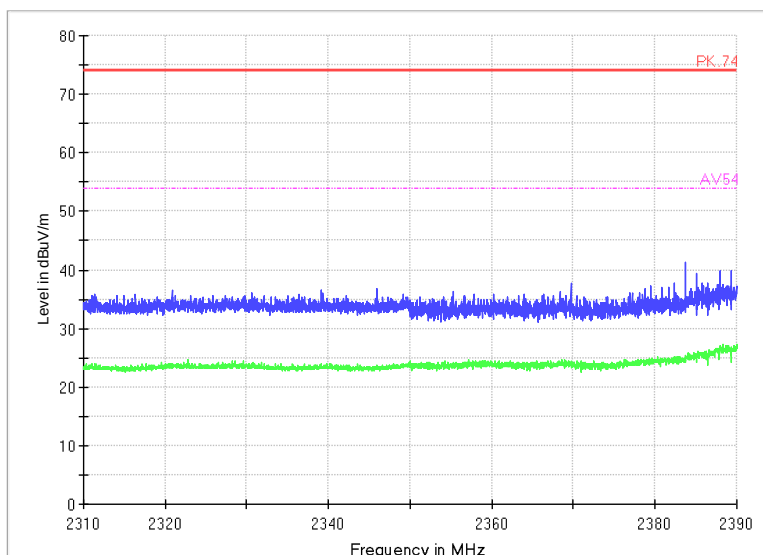


Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 125Khz S=8)

Polarity: Vertical



Carrier frequency (MHz): 2402

Channel No.:0

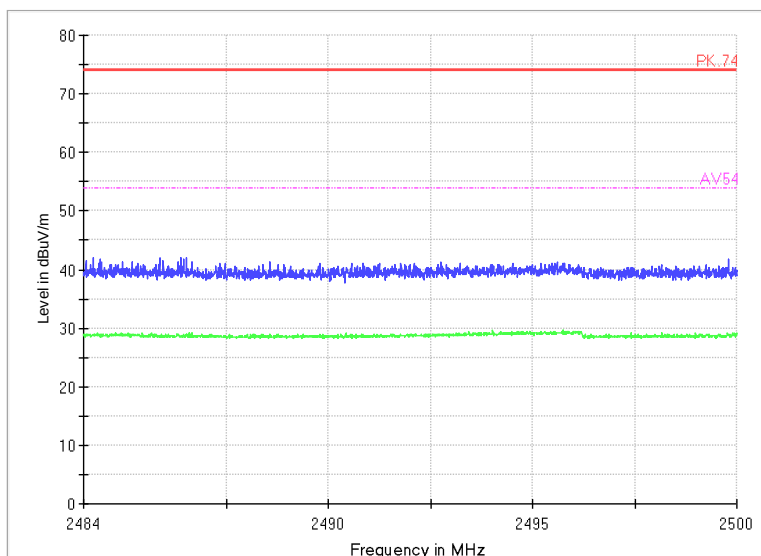
Test Mode: GFSK (LE 125Khz S=8)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

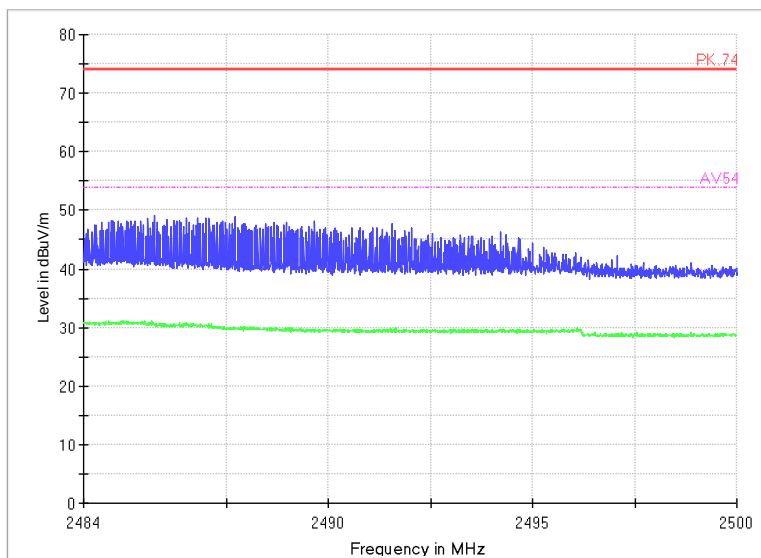


Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE 125Khz S=8)

Polarity: Vertical



Carrier frequency (MHz): 2480

Channel No.:39

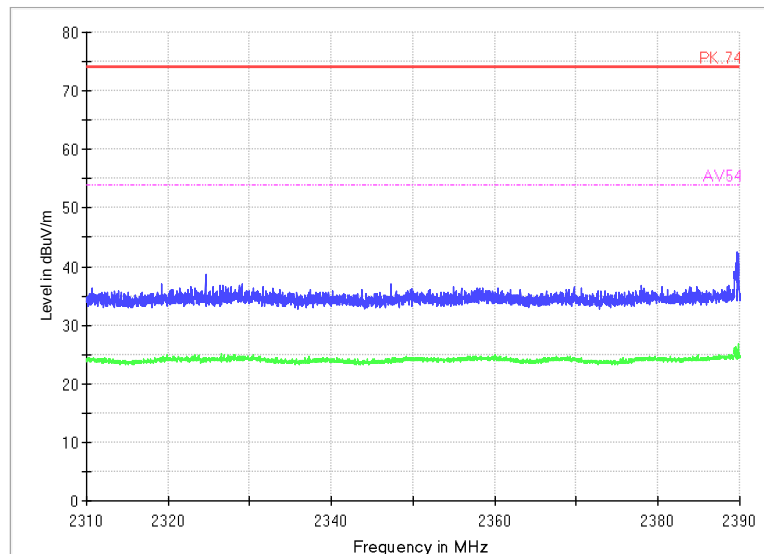
Test Mode: GFSK (LE 125Khz S=8)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

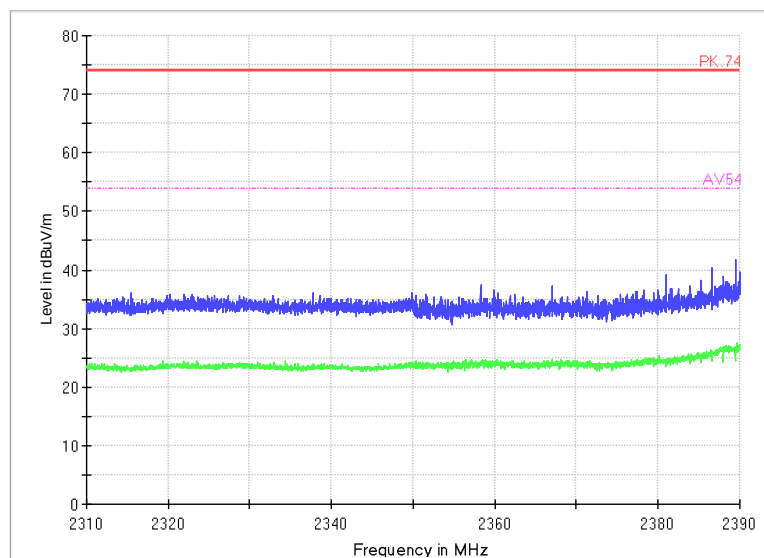


Carrier frequency (MHz): 2402

Channel No.:0

Test Mode: GFSK (LE 500Khz S=2)

Polarity: Vertical



Carrier frequency (MHz): 2402

Channel No.:0

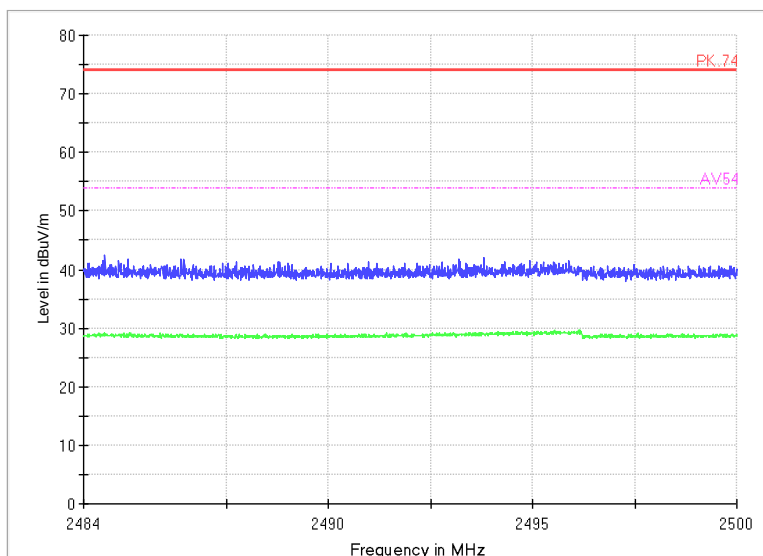
Test Mode: GFSK (LE 500Khz S=2)

Polarity: Horizontal



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

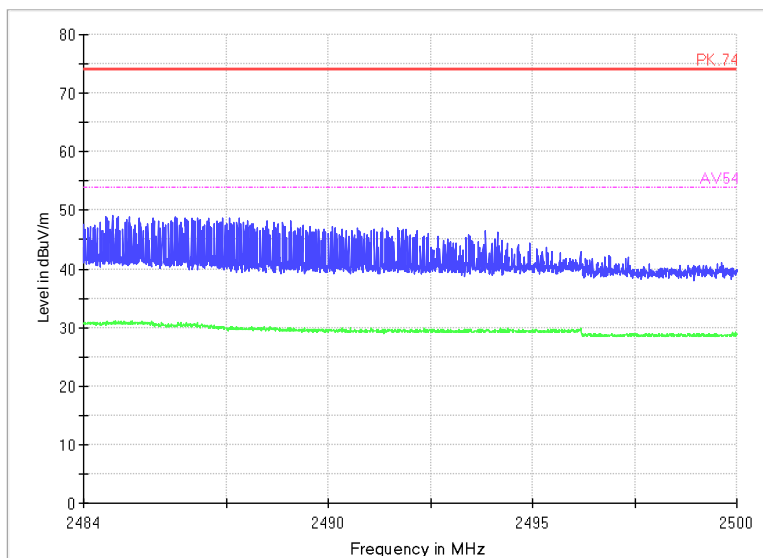


Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE 500Khz S=2)

Polarity: Vertical



Carrier frequency (MHz): 2480

Channel No.:39

Test Mode: GFSK (LE 500Khz S=2)

Polarity: Horizontal



Radiated Emission for BLE

After comparison, the worst case attitude is EUT lay down.

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation: $(14.63 \text{ dB}\mu\text{V/m}) = (30.03 \text{ BuV}) + (-15.4 \text{ dB/m})$, the corresponding frequency is 32.4735 MHz.

For GFSK (LE 1Mbps)

Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	14.63	-15.4	30.03	Vertical	40	25.37
77.724	32.65	-22	54.65	Vertical	40	7.35
117.009	32.92	-18.6	51.52	Vertical	43.5	10.58
208.965	21.35	-17.2	38.55	Vertical	43.5	22.15
538.862	14.01	-8.7	22.71	Vertical	46	31.99
903.291	18.71	-2.5	21.21	Vertical	46	27.29

Channel No.:19

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	15.13	-15.4	30.53	Vertical	40	24.87
77.1905	31.31	-21.9	53.21	Vertical	40	8.69
117.1545	32.97	-18.6	51.57	Vertical	43.5	10.53
211.972	20.4	-17.2	37.6	Vertical	43.5	23.1
504.8635	14.18	-9.2	23.38	Vertical	46	31.82
921.2845	19.29	-1.7	20.99	Vertical	46	26.71

Channel No.:39

Frequency	Result	ARpl	Pmea	Polarity	Limit	Margin
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BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

(MHz)	(dBuV/m)	(dB)	(dBuV/m)		(dBuV/m)	(dB)
49.788	14.73	-15.4	30.13	Vertical	40	25.27
77.724	32.18	-22	54.18	Vertical	40	7.82
117.3	33.44	-18.7	52.14	Vertical	43.5	10.06
209.2075	21.86	-17.2	39.06	Vertical	43.5	21.64
556.0795	14.28	-8.1	22.38	Vertical	46	31.72
930.3055	19.23	-1.6	20.83	Vertical	46	26.77

For GFSK (LE 2Mbps)

Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	14.96	-15.4	30.36	Vertical	40	25.04
77.6755	31.96	-22	53.96	Vertical	40	8.04
117.1545	33.04	-18.6	51.64	Vertical	43.5	10.46
210.032	21.3	-17.2	38.5	Vertical	43.5	22.2
524.021	14.44	-8.7	23.14	Vertical	46	31.56
917.065	19.22	-1.9	21.12	Vertical	46	26.78

Channel No.:19

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	15.25	-15.4	30.65	Vertical	40	24.75
77.627	31.58	-22	53.58	Vertical	40	8.42
117.3485	32.89	-18.7	51.59	Vertical	43.5	10.61
205.0365	21.24	-17.1	38.34	Vertical	43.5	22.26
490.265	13.42	-9.3	22.72	Vertical	46	32.58
897.18	18.69	-2.5	21.19	Vertical	46	27.31

Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
42.319	13.87	-16.4	30.27	Vertical	40	26.13
77.6755	32.37	-22	54.37	Vertical	40	7.63
117.106	32.95	-18.6	51.55	Vertical	43.5	10.55



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204.503	21.11	-17.1	38.21	Vertical	43.5	22.39
514.6605	14.58	-8.9	23.48	Vertical	46	31.42
899.9445	18.66	-2.5	21.16	Vertical	46	27.34

For GFSK (LE 125Khz S=8)

Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
42.028	13.54	-16.4	29.94	Vertical	40	26.46
77.724	32.78	-22	54.78	Vertical	40	7.22
117.106	32.94	-18.6	51.54	Vertical	43.5	10.56
204.9395	21.24	-17.1	38.34	Vertical	43.5	22.26
521.5475	14.64	-8.8	23.44	Vertical	46	31.36
876.616	18.84	-2.3	21.14	Vertical	46	27.16

Channel No.:19

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	15.41	-15.4	30.81	Vertical	40	24.59
77.627	31.73	-22	53.73	Vertical	40	8.27
116.815	33.95	-18.5	52.45	Vertical	43.5	9.55
209.159	21.86	-17.2	39.06	Vertical	43.5	21.64
522.275	14.48	-8.7	23.18	Vertical	46	31.52
863.4725	18.47	-2.5	20.97	Vertical	46	27.53

Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
50.661	11.43	-15.4	26.83	Vertical	40	28.57
77.6755	32.29	-22	54.29	Vertical	40	7.71
117.0575	32.96	-18.6	51.56	Vertical	43.5	10.54
209.159	21.63	-17.2	38.83	Vertical	43.5	21.87
519.3165	14.83	-8.8	23.63	Vertical	46	31.18
944.128	18.72	-2	20.72	Vertical	46	27.28



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

For GFSK (LE 500Khz S=2)

Channel No.:0

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	15.51	-15.4	30.91	Vertical	40	24.49
77.53	31.25	-22	53.25	Vertical	40	8.75
117.494	34.03	-18.7	52.73	Vertical	43.5	9.47
208.965	21.58	-17.2	38.78	Vertical	43.5	21.92
524.1665	14.5	-8.7	23.2	Vertical	46	31.5
896.695	18.76	-2.5	21.26	Vertical	46	27.24

Channel No.:19

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.788	15.43	-15.4	30.83	Vertical	40	24.57
77.6755	32.18	-22	54.18	Vertical	40	7.82
116.912	32.87	-18.6	51.47	Vertical	43.5	10.63
208.2375	21.13	-17.2	38.33	Vertical	43.5	22.37
514.5635	14.6	-8.9	23.5	Vertical	46	31.4
886.801	18.87	-2.4	21.27	Vertical	46	27.13

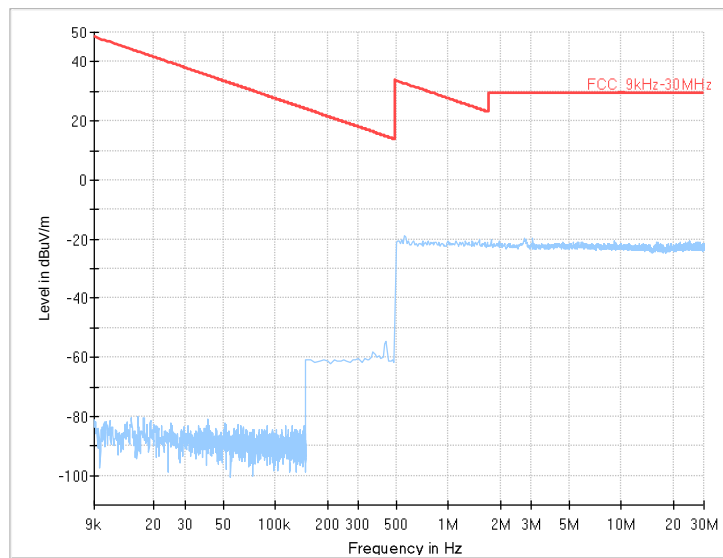
Channel No.:39

Frequency (MHz)	Result (dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
49.8365	15.33	-15.4	30.73	Vertical	40	24.67
77.6755	32.85	-22	54.85	Vertical	40	7.15
117.591	32.92	-18.8	51.72	Vertical	43.5	10.58
209.062	21.76	-17.2	38.96	Vertical	43.5	21.74
517.328	14.74	-8.8	23.54	Vertical	46	31.26
916.386	19.18	-1.9	21.08	Vertical	46	26.82



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Test Report No.: PSU-NQN2504150110RF07



Frequency Range: 9kHz -30MHz

Detector: QP mode

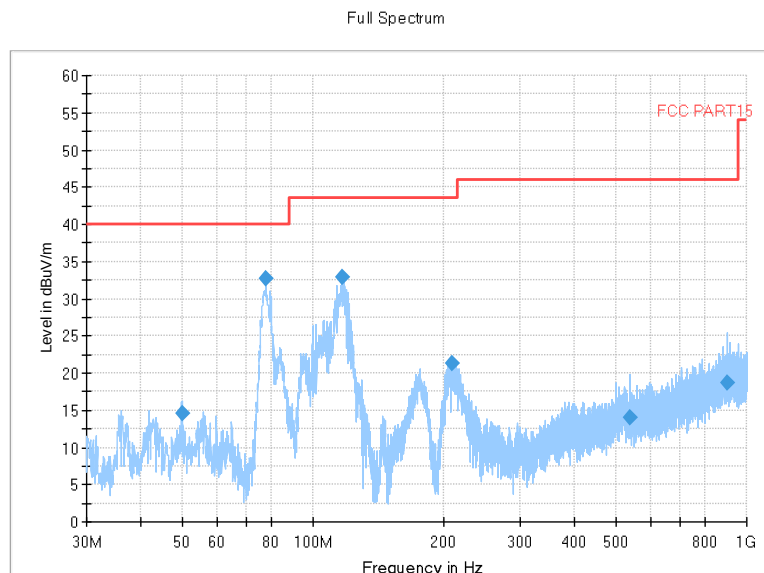
Note: The relevant tests have been performed in order to verify in which mode would have the worst features, the result show above is the worst case.



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

LE 1Mbps

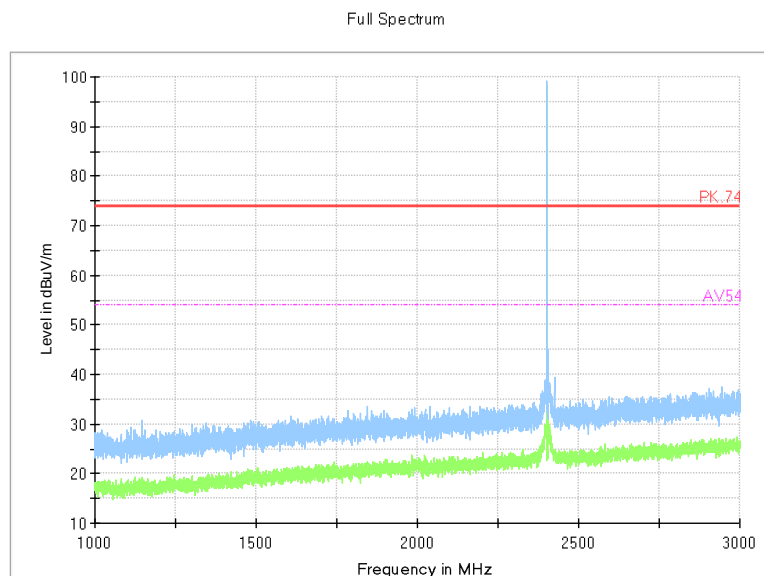
Channel No.:0



Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 1Mbps)



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

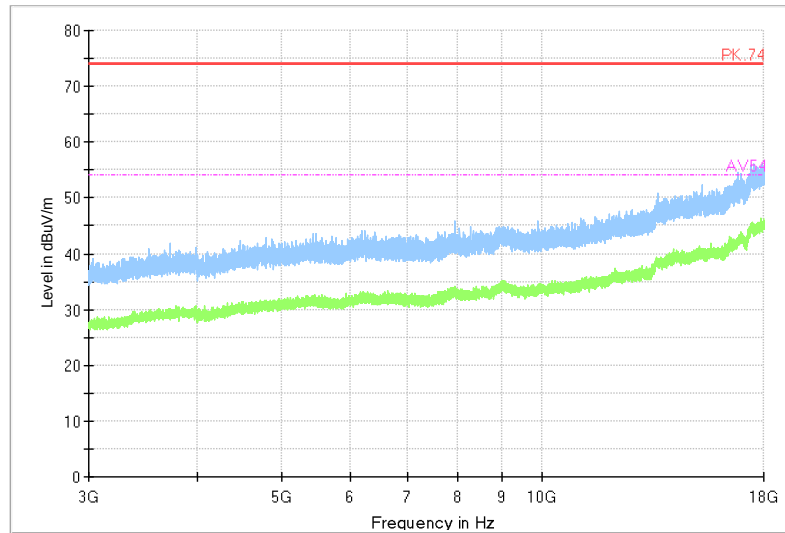
Modulation type: GFSK (LE 1Mbps)



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VERITAS

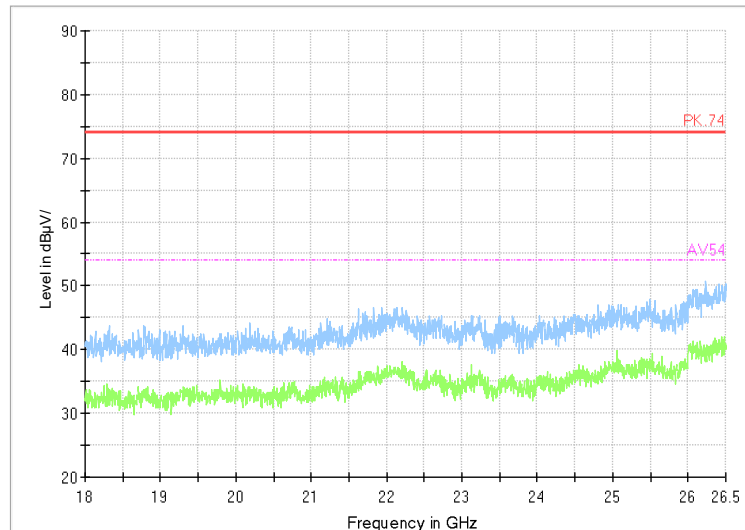
Test Report No.: PSU-NQN2504150110RF07

Full Spectrum



Frequency Range: 3GHz-18GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 1Mbps)

Full Spectrum



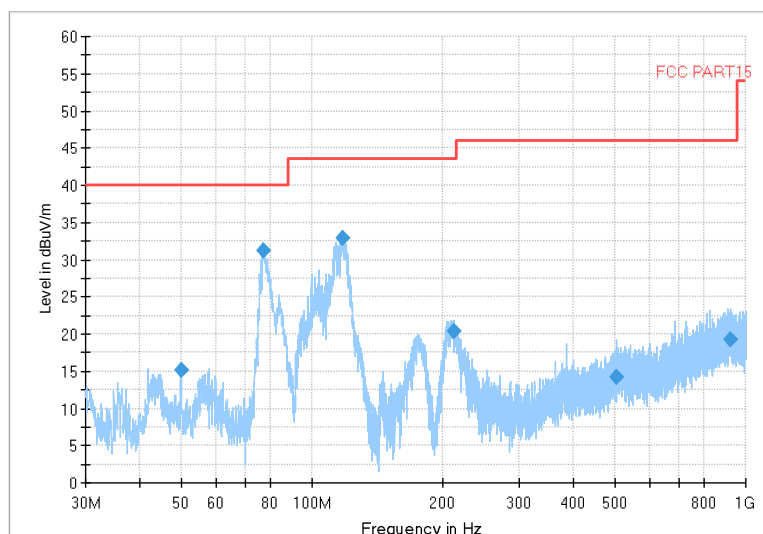
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 1Mbps)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Channel No.:19

Full Spectrum

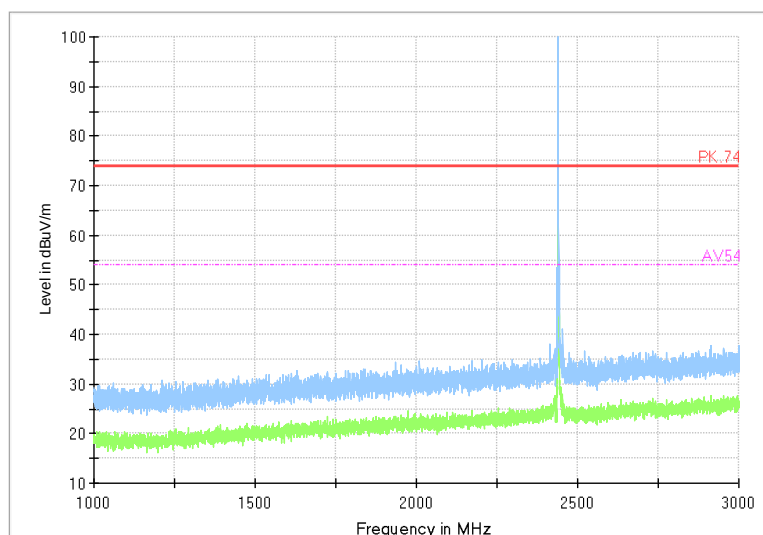


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 1Mbps)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

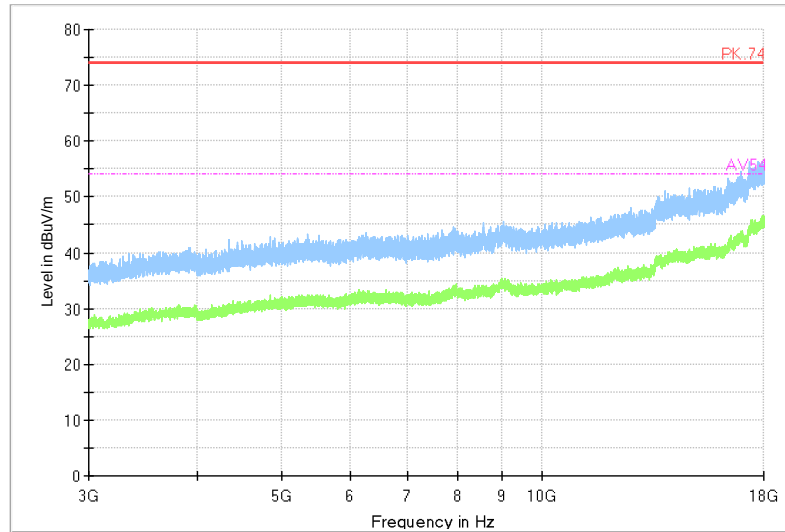
Modulation type: GFSK (LE 1Mbps)



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

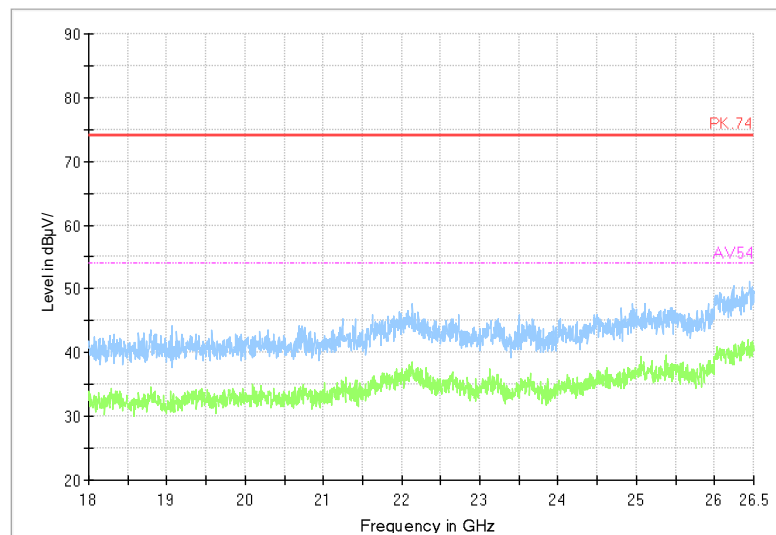


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 1Mbps)

Full Spectrum



Frequency Range: 18GHz-26GHz

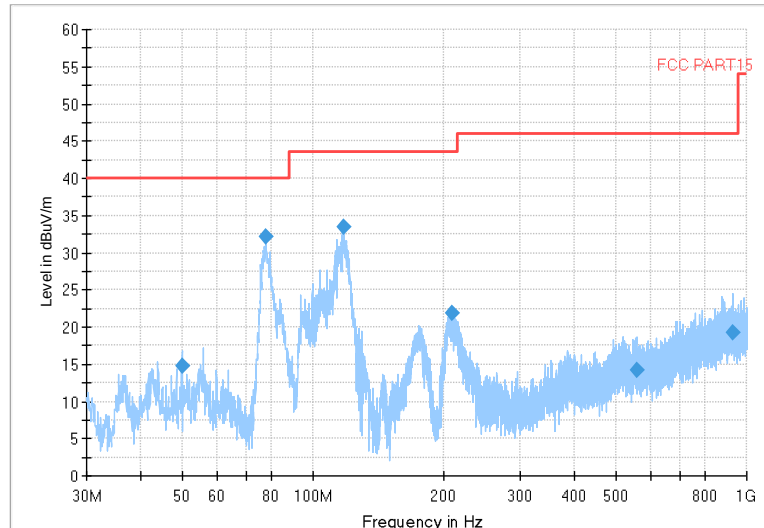
Detector: Av mode and PK mode

Modulation type: GFSK (LE 1Mbps)



Channel No.:39

Full Spectrum

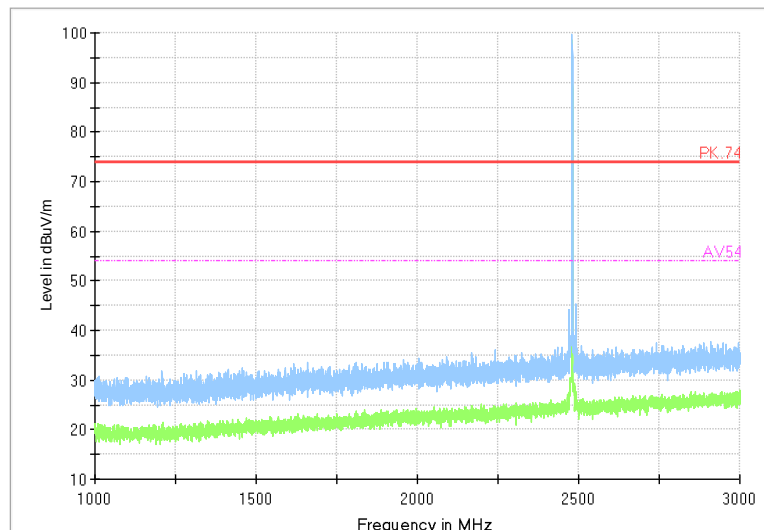


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 1Mbps)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

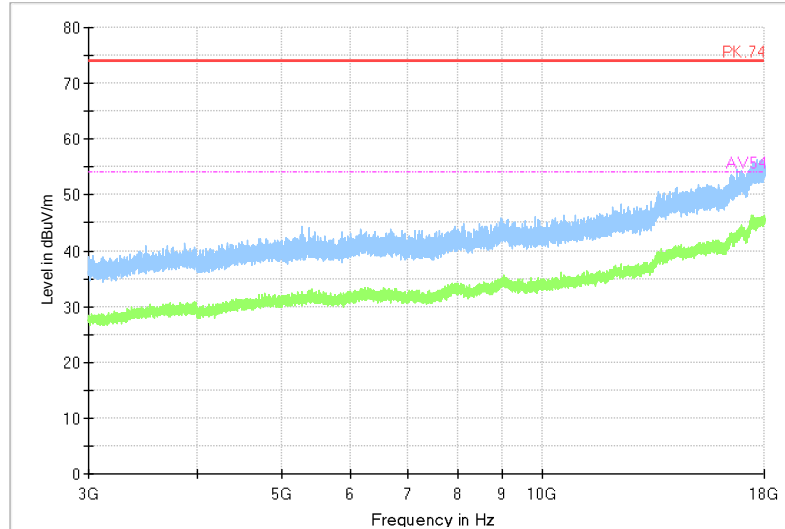
Modulation type: GFSK (LE 1Mbps)



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VERITAS

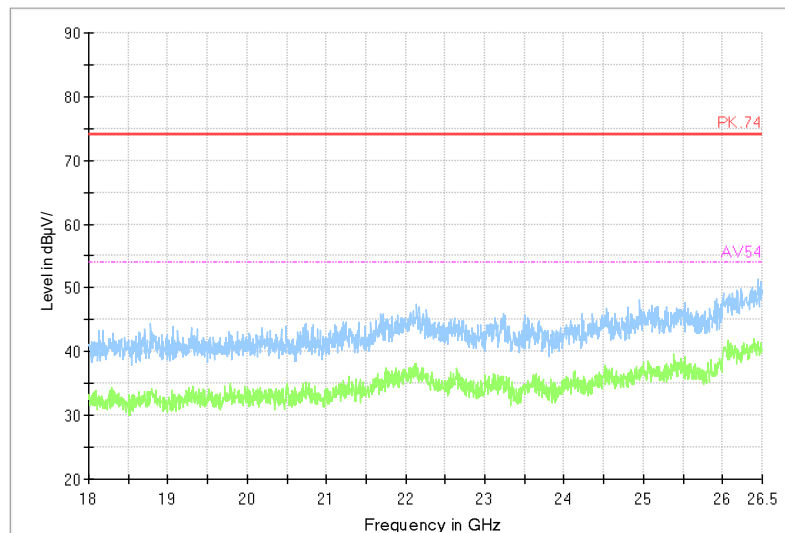
Test Report No.: PSU-NQN2504150110RF07

Full Spectrum



Frequency Range: 3GHz-18GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 1Mbps)

Full Spectrum



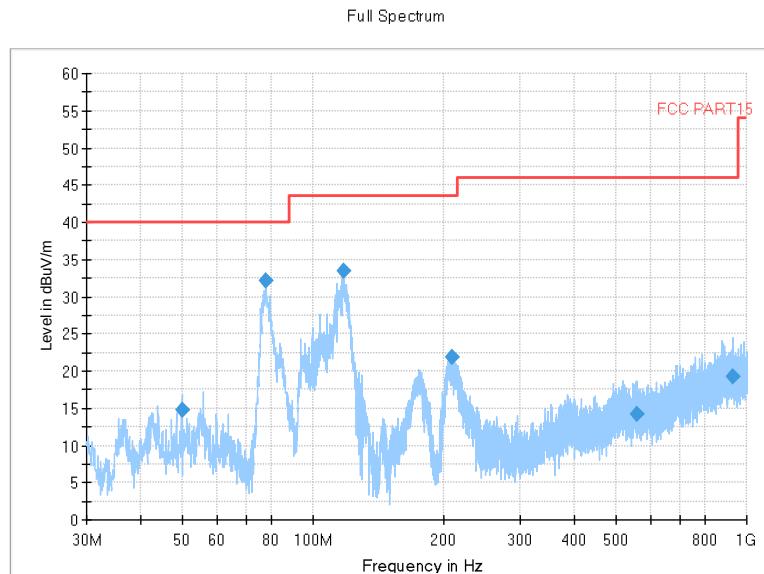
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 1Mbps)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

LE 2Mbps

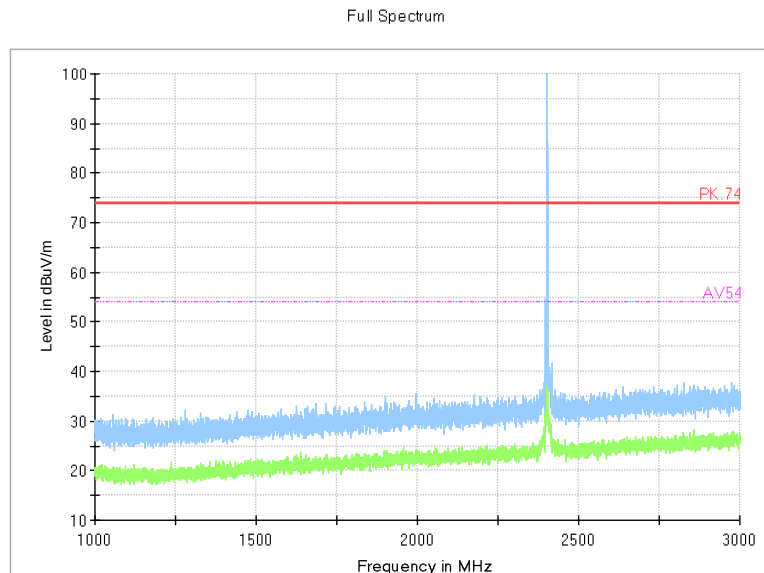
Channel No.:0



Frequency Range: 30MHz-1GHz

Detector:QP mode

Modulation type: GFSK (LE 2Mbps)



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

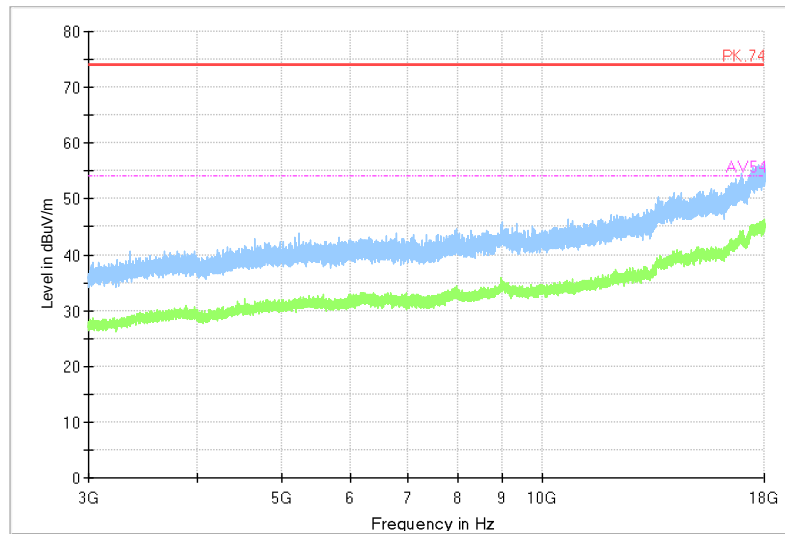
Modulation type: GFSK (LE 2Mbps)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

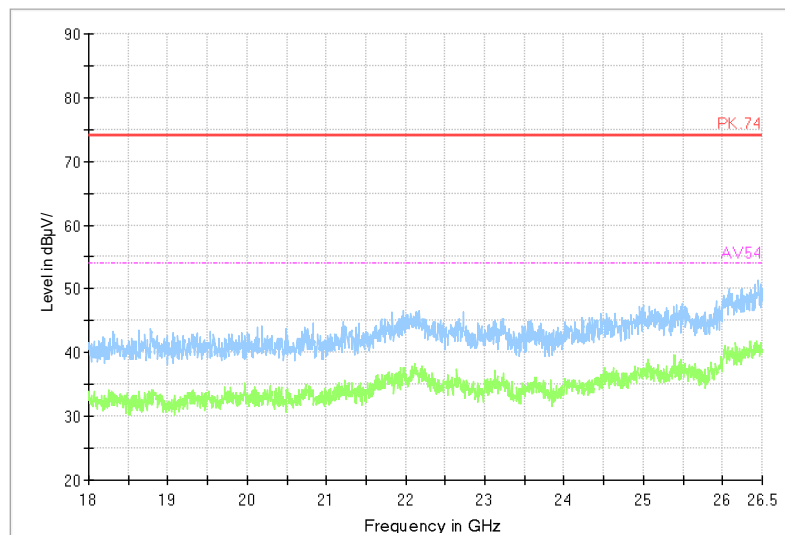


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 2Mbps)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

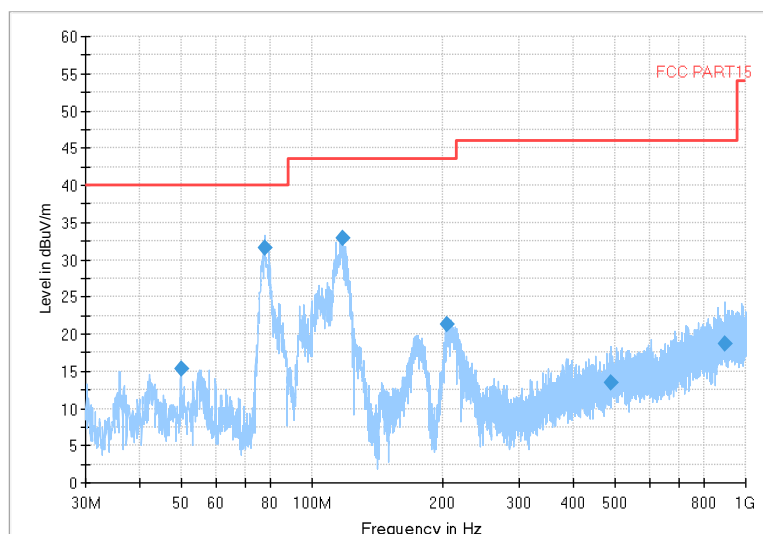
Modulation type: GFSK (LE 2Mbps)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Channel No.:19

Full Spectrum

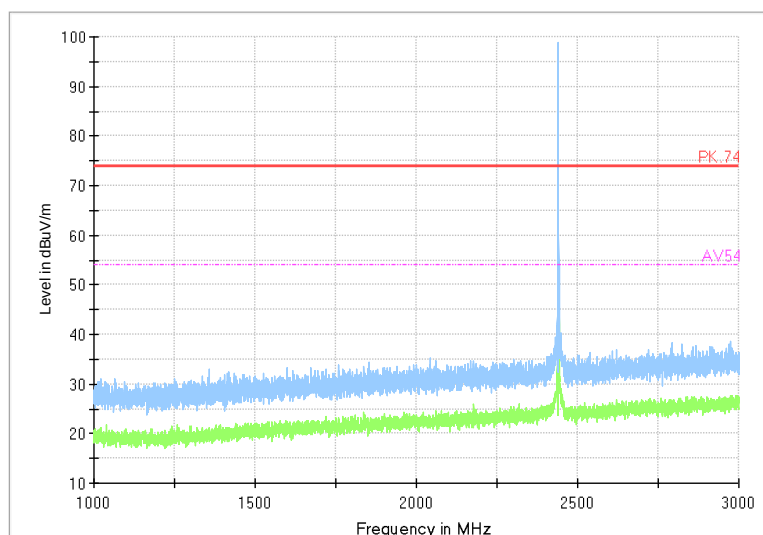


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 2Mbps)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

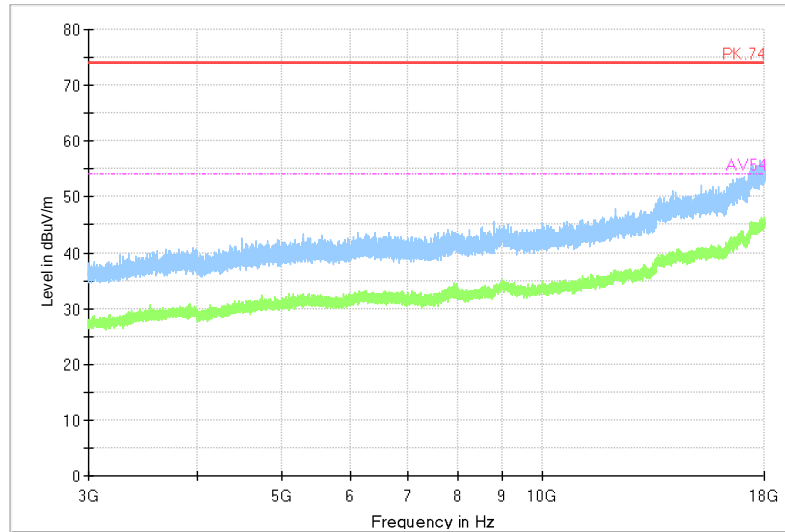
Modulation type: GFSK (LE 2Mbps)



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Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

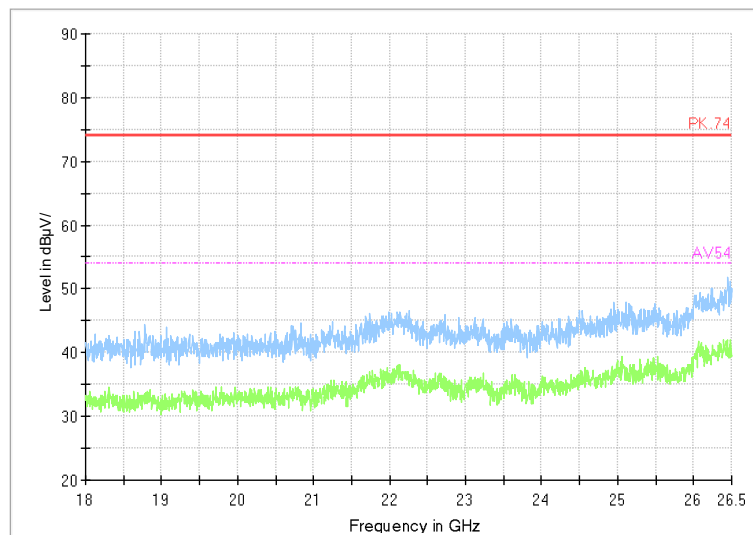


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 2Mbps)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 2Mbps)

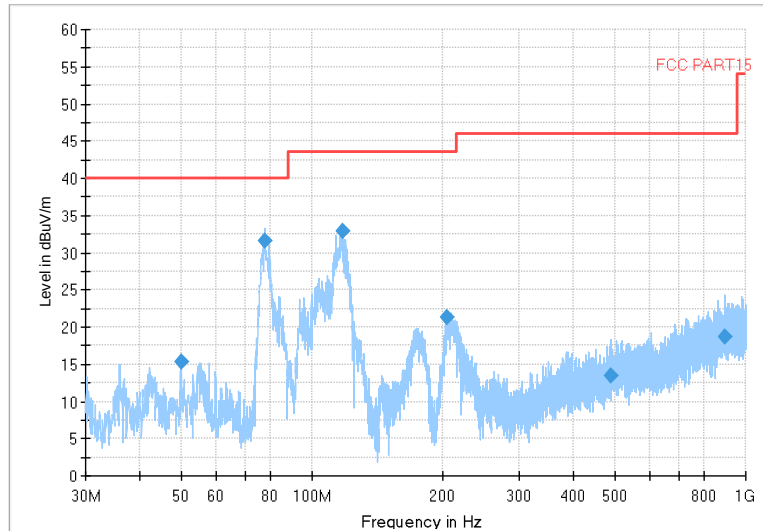


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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Channel No.:39

Full Spectrum

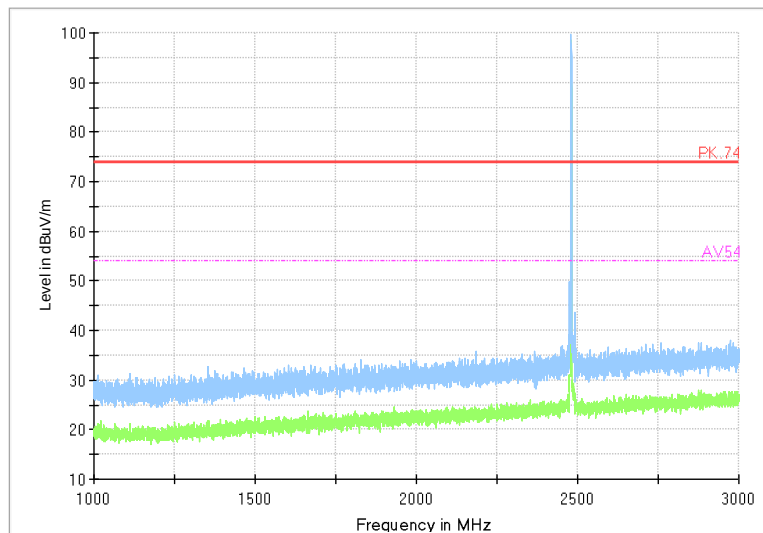


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 2Mbps)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

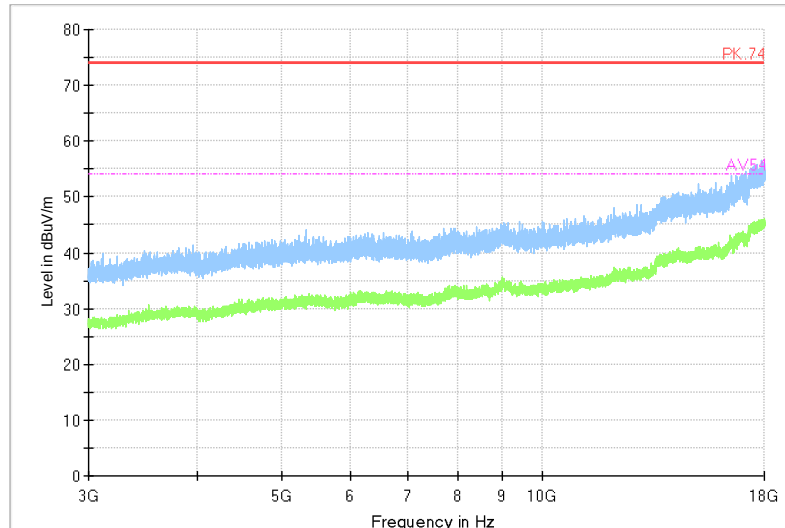
Modulation type: GFSK (LE 2Mbps)



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VERITAS

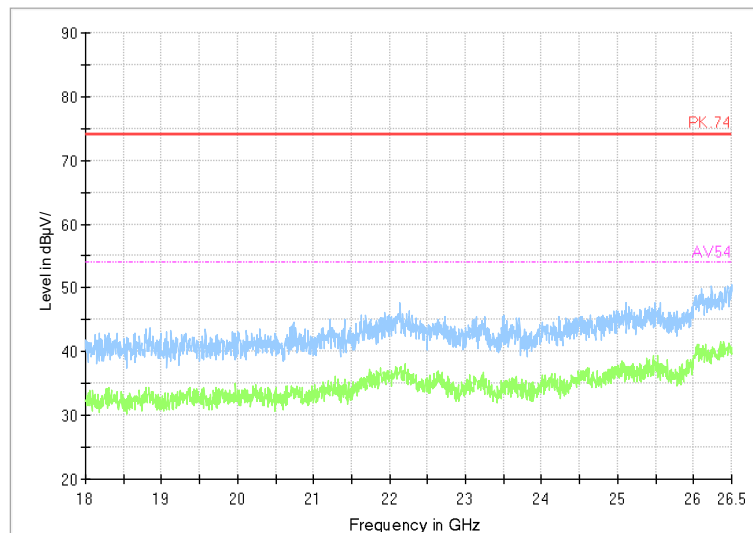
Test Report No.: PSU-NQN2504150110RF07

Full Spectrum



Frequency Range: 3GHz-18GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 2Mbps)

Full Spectrum



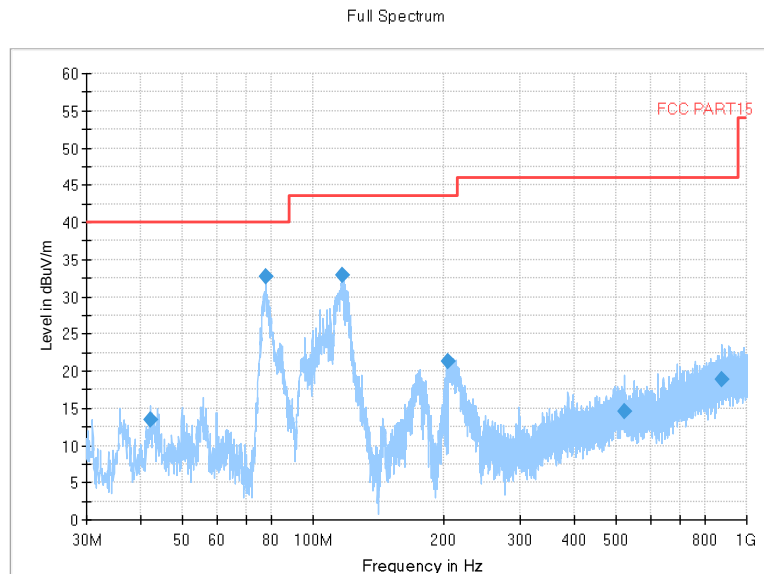
Frequency Range: 18GHz-26GHz
Detector: Av mode and PK mode
Modulation type: GFSK (LE 2Mbps)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

LE 125Khz S=8

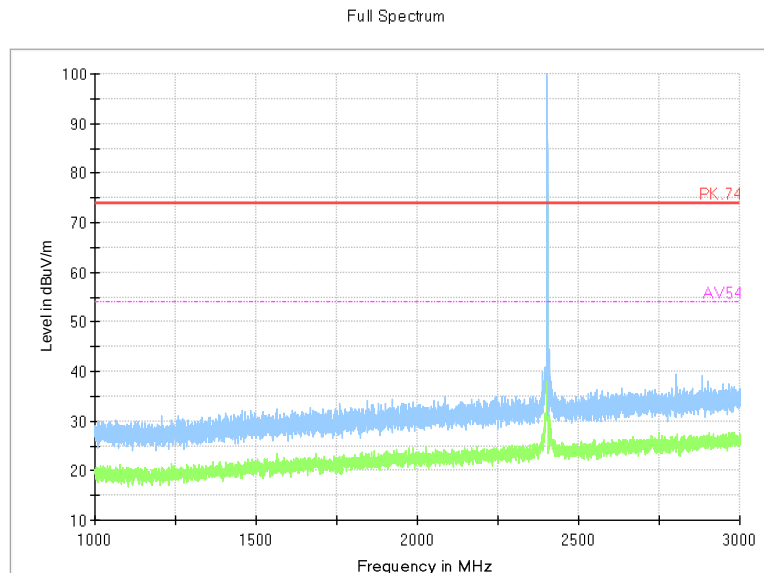
Channel No.:0



Frequency Range: 30MHz-1GHz

Detector:QP mode

Modulation type: GFSK (LE 125Khz S=8)



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

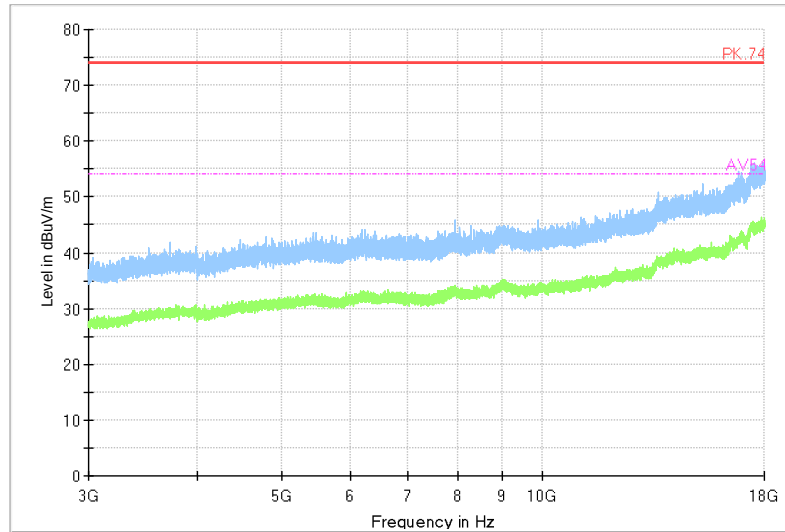
Modulation type: GFSK (LE 125Khz S=8)



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Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

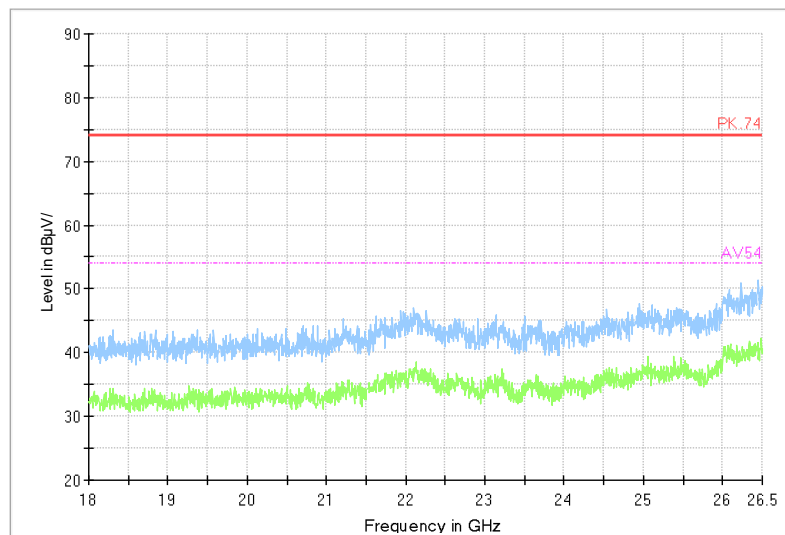


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 125Khz S=8)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

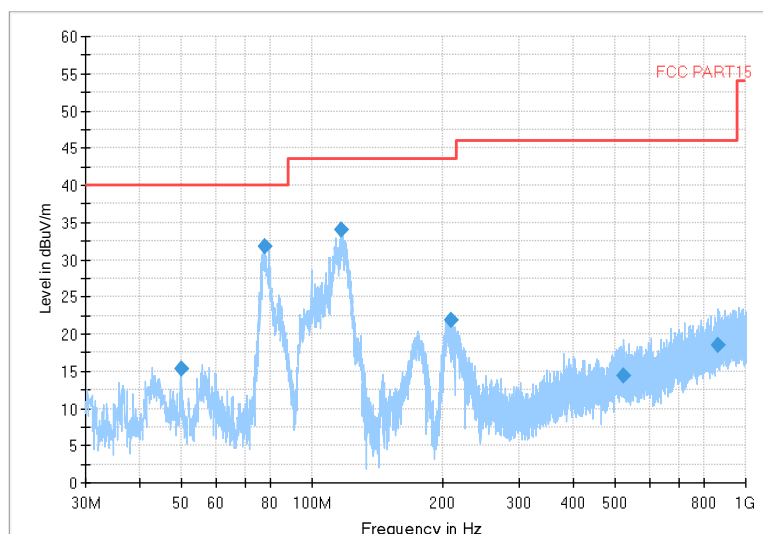
Modulation type: (LE 125Khz S=8)



BUREAU Test Report No.: PSU-NQN2504150110RF07
VERITAS

Channel No.:19

Full Spectrum

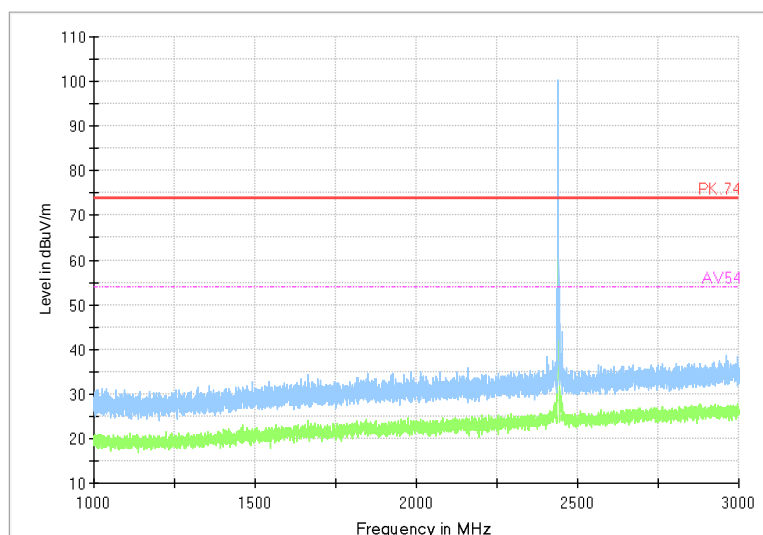


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 125Khz S=8)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

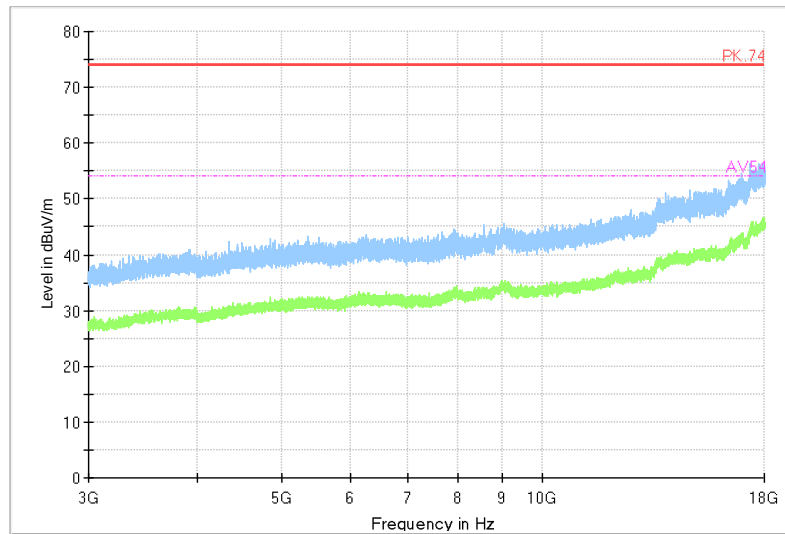
Modulation type: GFSK (LE 125Khz S=8)



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

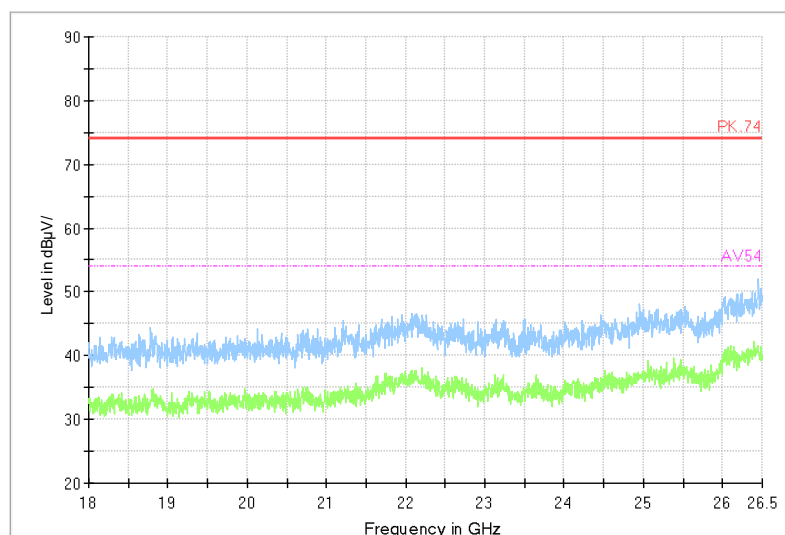


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 125Khz S=8)

Full Spectrum



Frequency Range: 18GHz-26GHz

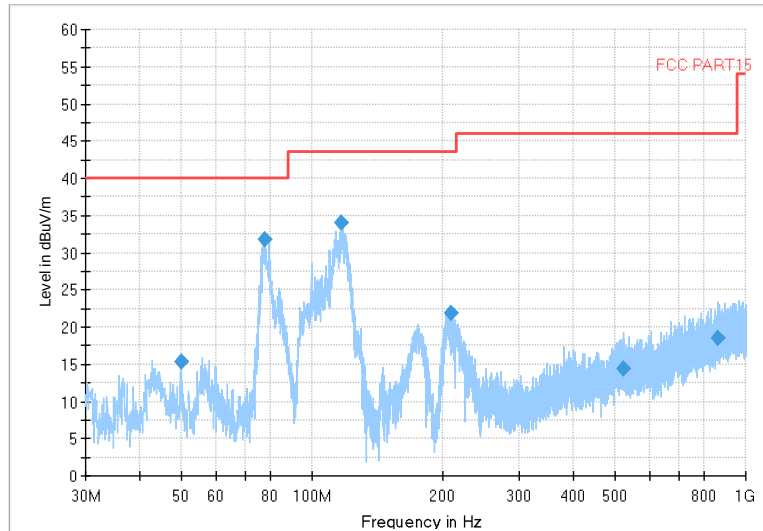
Detector: Av mode and PK mode

Modulation type: GFSK (LE 125Khz S=8)



Channel No.:39

Full Spectrum

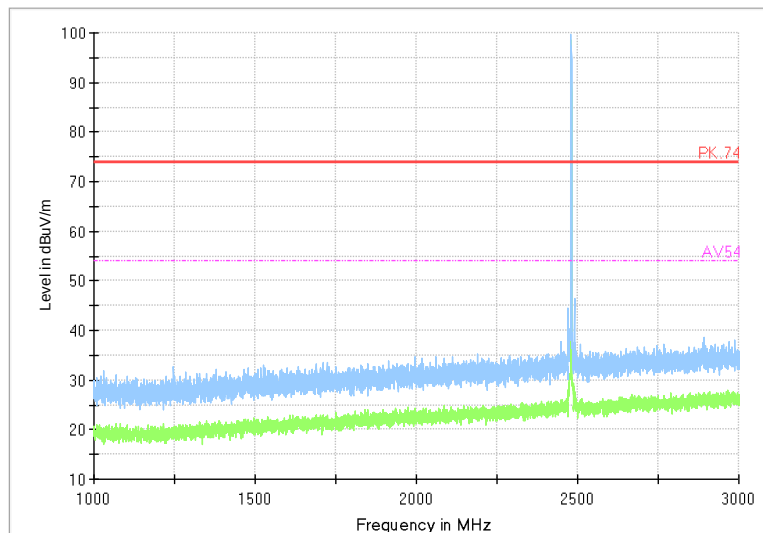


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 125Khz S=8)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

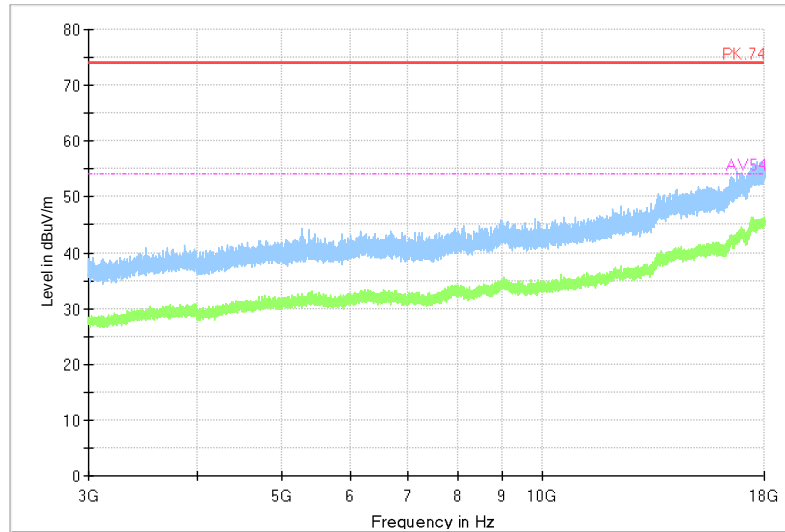
Modulation type: GFSK (LE 125Khz S=8)



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Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

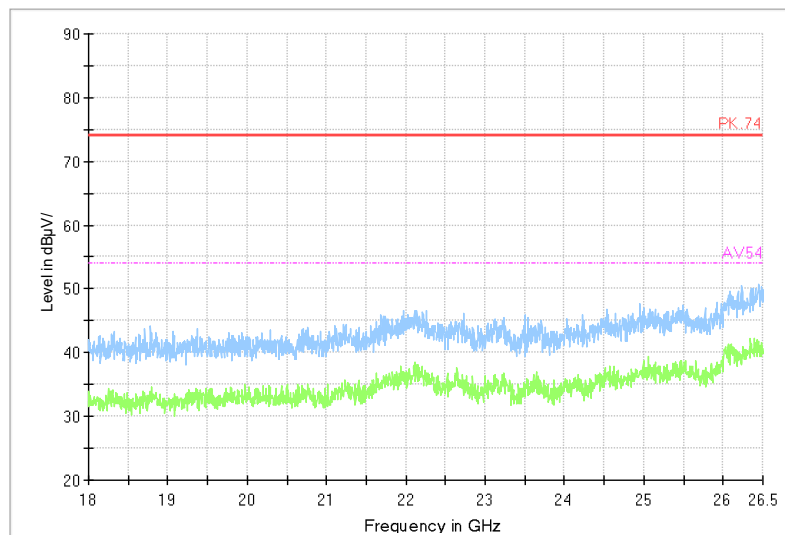


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 125Khz S=8)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

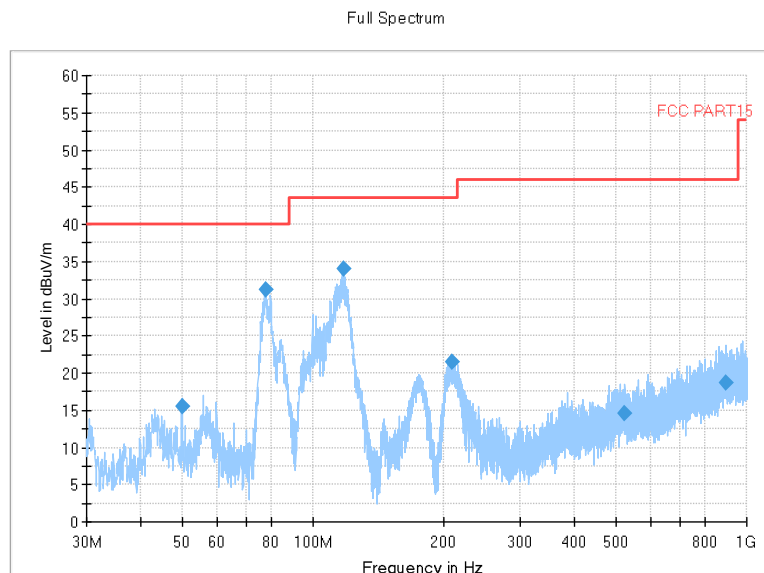
Modulation type: GFSK (LE 125Khz S=8)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

LE 500Khz S=2

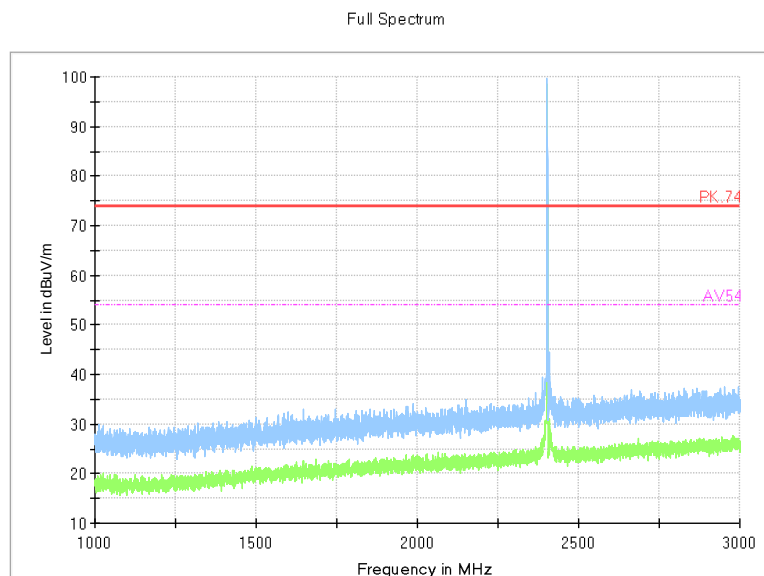
Channel No.:0



Frequency Range: 30MHz-1GHz

Detector:QP mode

Modulation type: GFSK (LE 500Khz S=2)



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

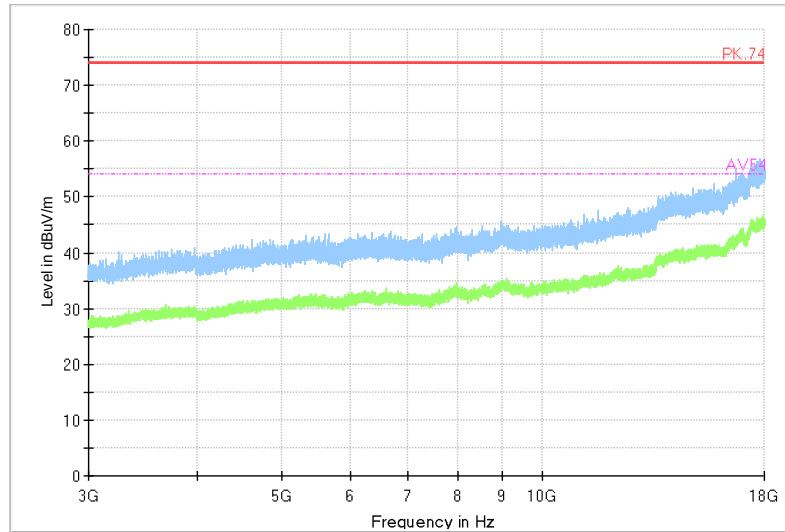
Modulation type: GFSK (LE 500Khz S=2)



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

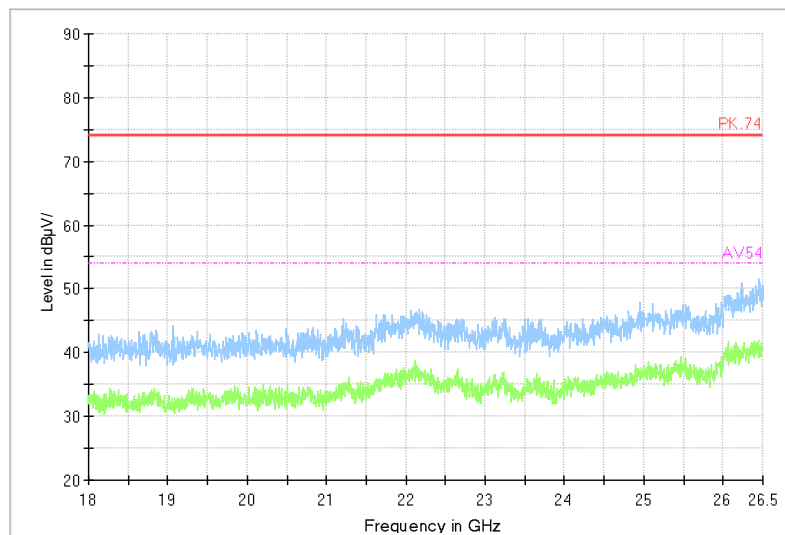


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 500Khz S=2)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

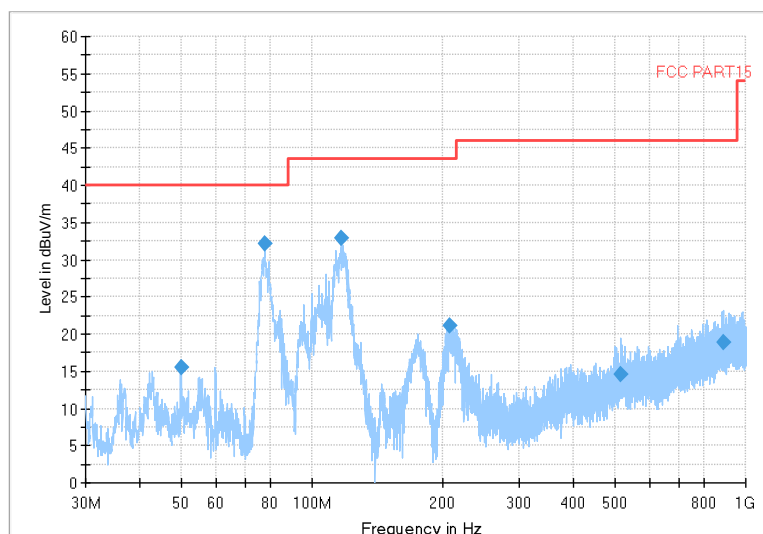
Modulation type: (LE 500Khz S=2)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Channel No.:19

Full Spectrum

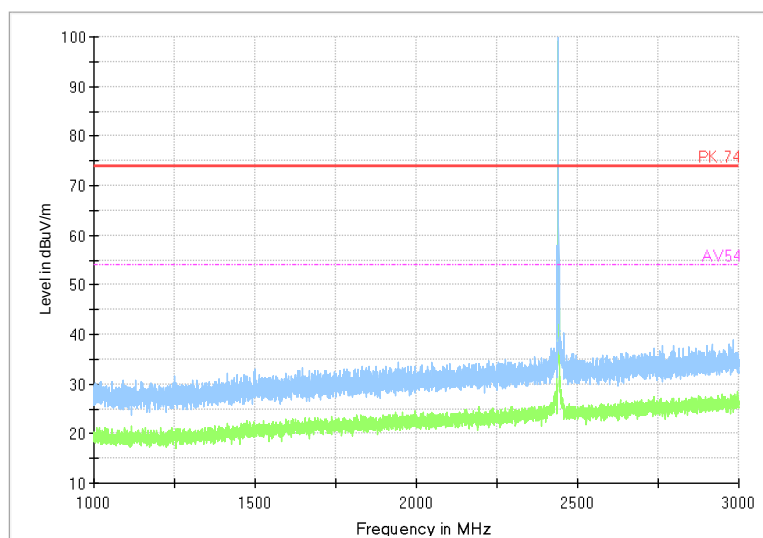


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 500Khz S=2)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

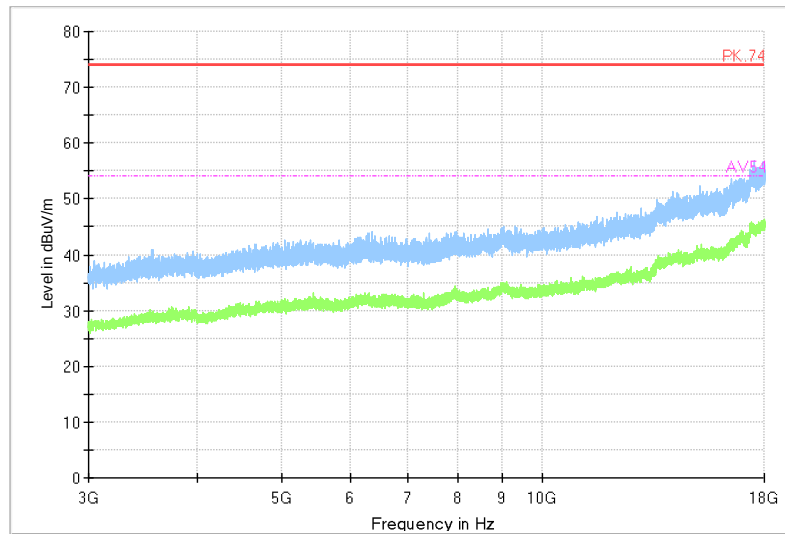
Modulation type: GFSK (LE 500Khz S=2)



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

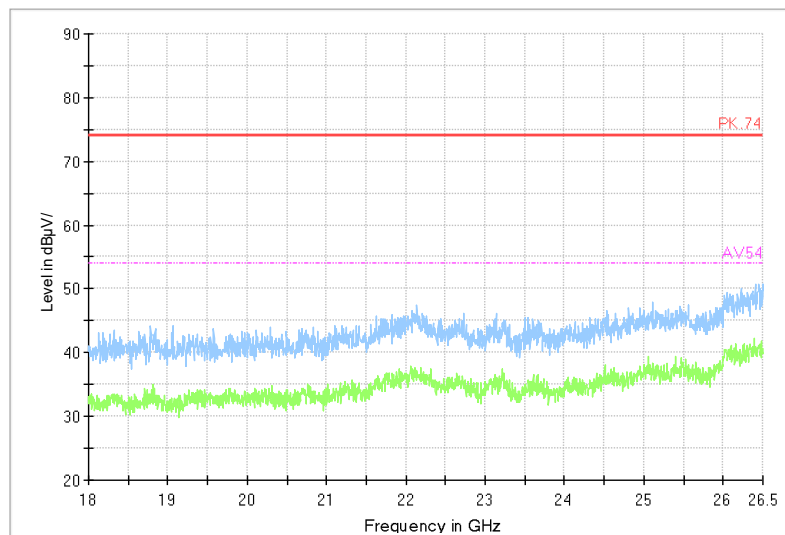


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 500Khz S=2)

Full Spectrum



Frequency Range: 18GHz-26GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 500Khz S=2)

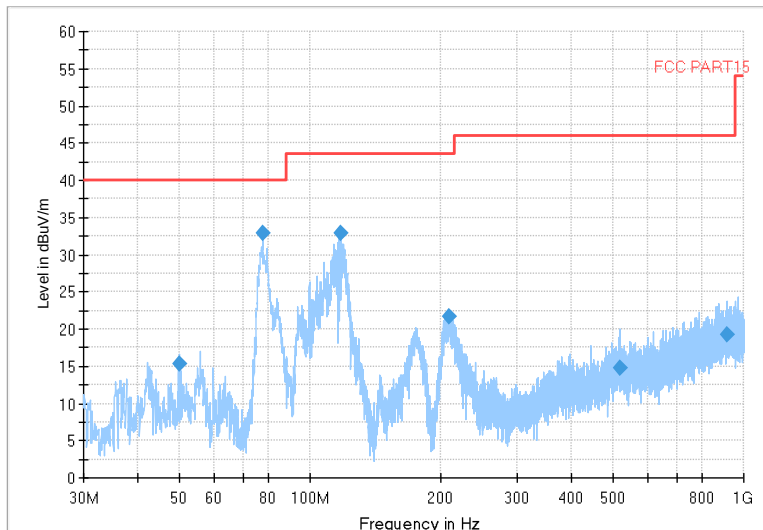


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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Channel No.:39

Full Spectrum

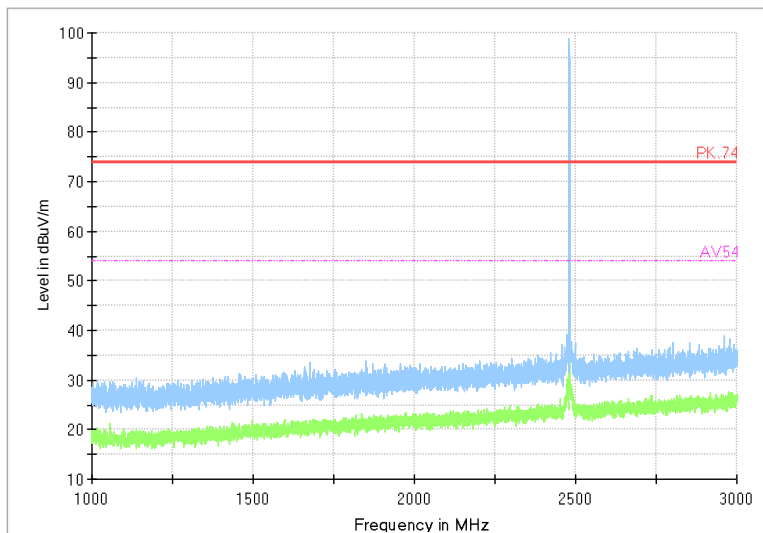


Frequency Range: 30MHz-1GHz

Detector: QP mode

Modulation type: GFSK (LE 500Khz S=2)

Full Spectrum



Frequency Range: 1GHz-3GHz

Detector: Av mode and PK mode

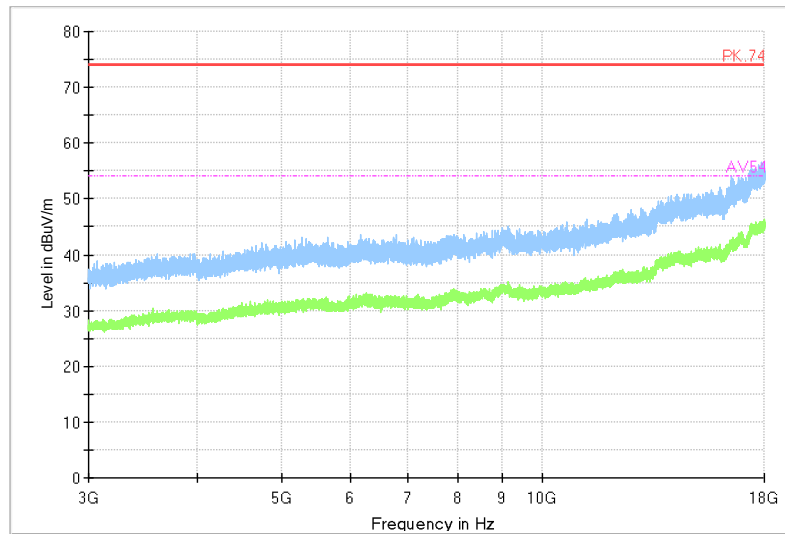
Modulation type: GFSK (LE 500Khz S=2)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

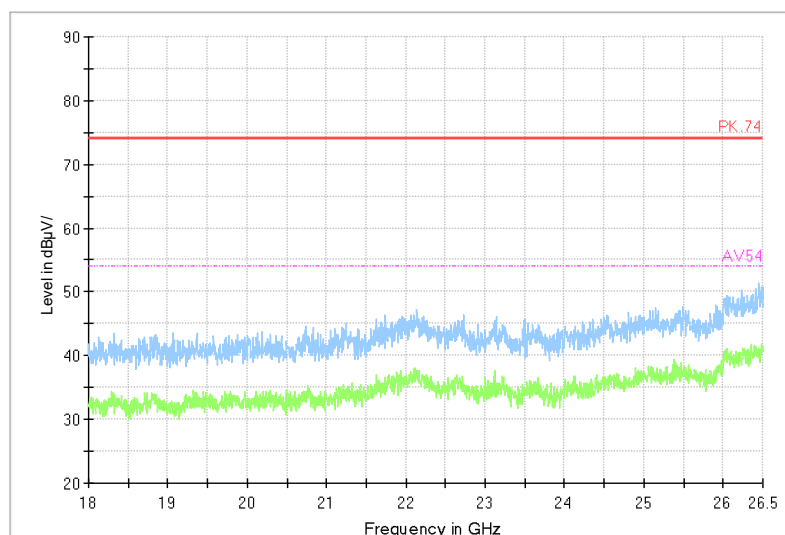


Frequency Range: 3GHz-18GHz

Detector: Av mode and PK mode

Modulation type: GFSK (LE 500Khz S=2)

Full Spectrum



Frequency Range: 18GHz-26GHz

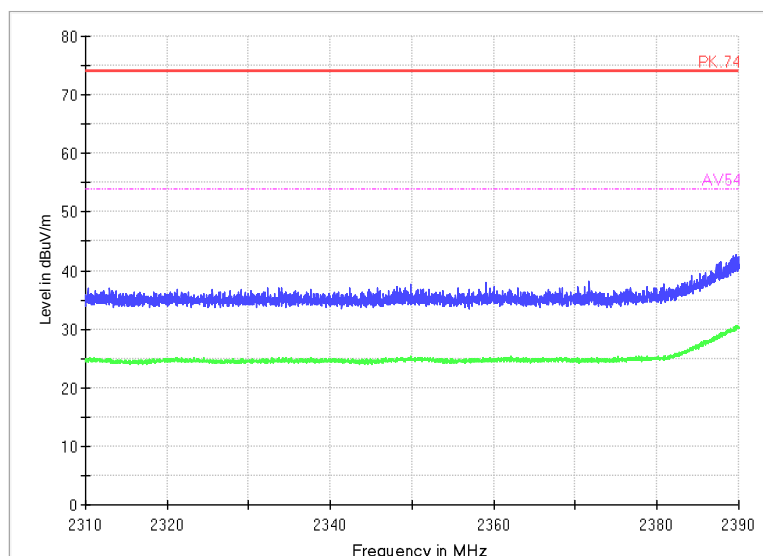
Detector: Av mode and PK mode

Modulation type: GFSK (LE 500Khz S=2)



BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Radiated Emission Band Edge for WIFI

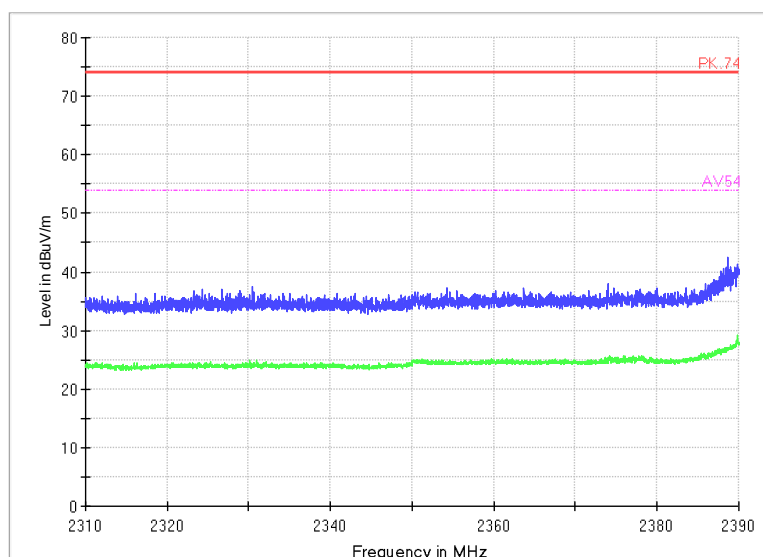


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11b

Polarization: V

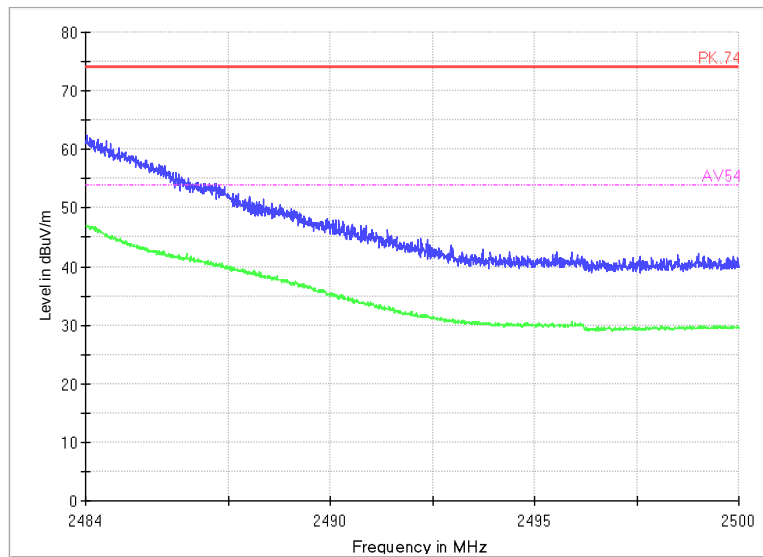


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11b

Polarization: H

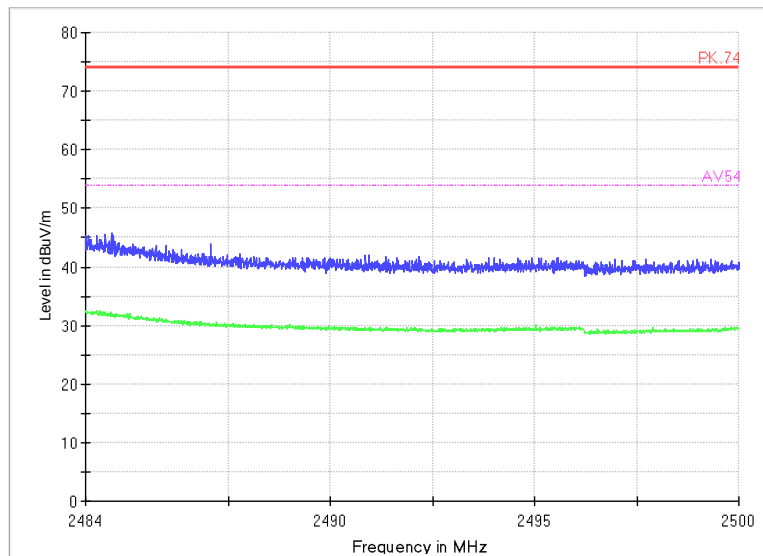


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11b

Polarization: V



Radiated Emission Band Edge

Channel No.:11

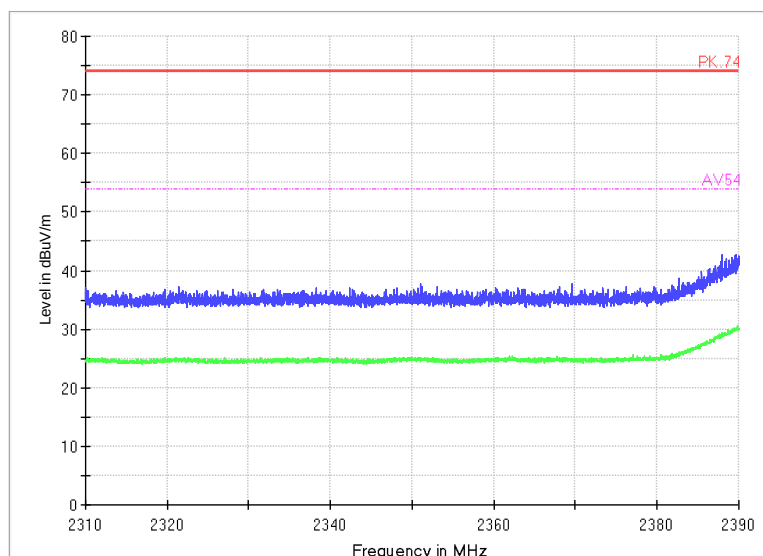
Test Mode: 802.11b

Polarization: H



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

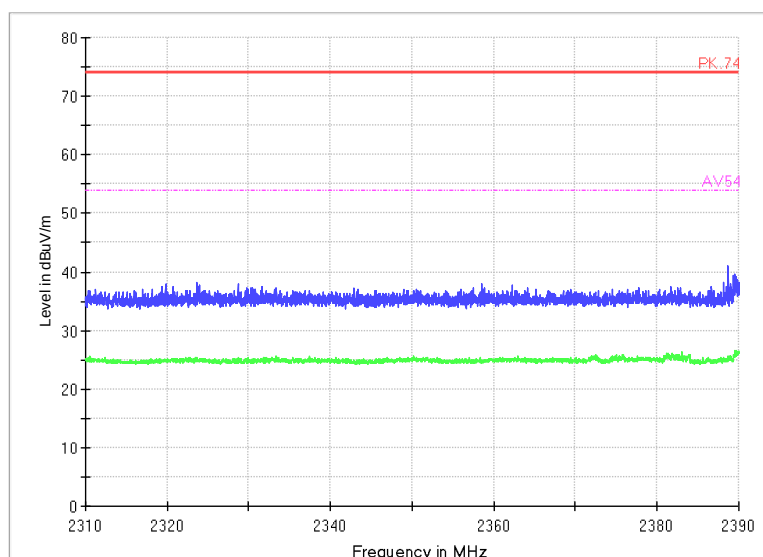


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11g

Polarization: V



Radiated Emission Band Edge

Channel No.:1

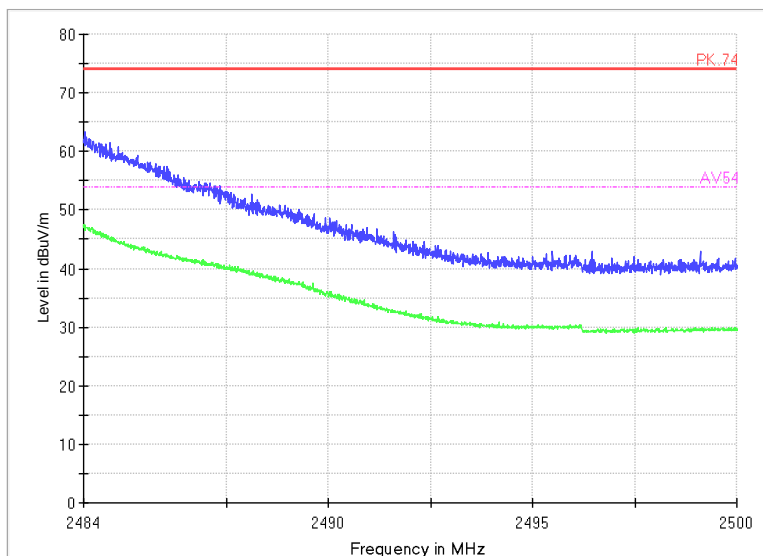
Test Mode: 802.11g

Polarization: H



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

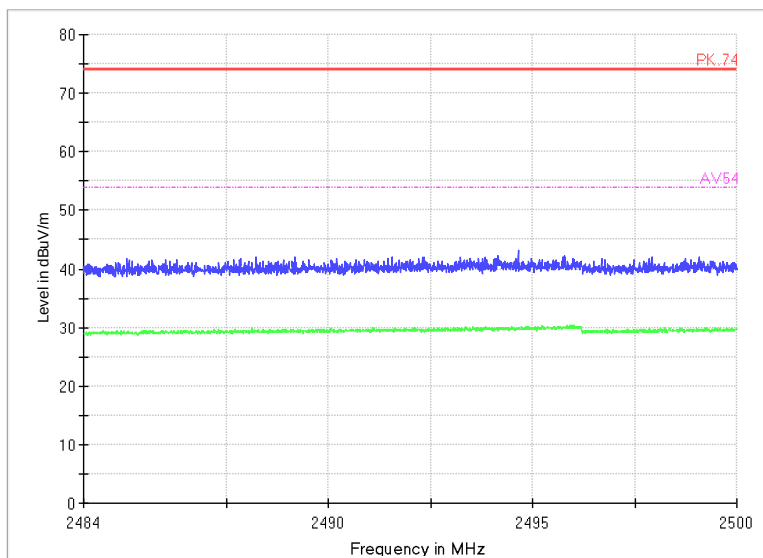


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11g

Polarization: V



Radiated Emission Band Edge

Channel No.:11

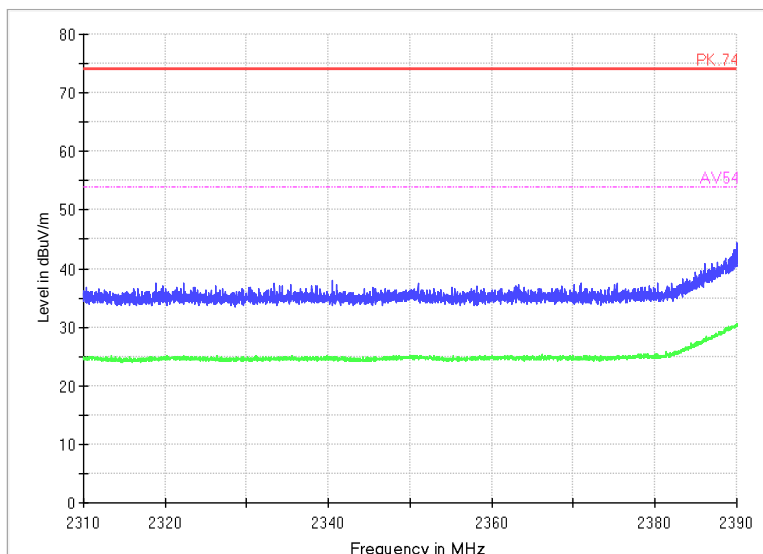
Test Mode: 802.11g

Polarization: H



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

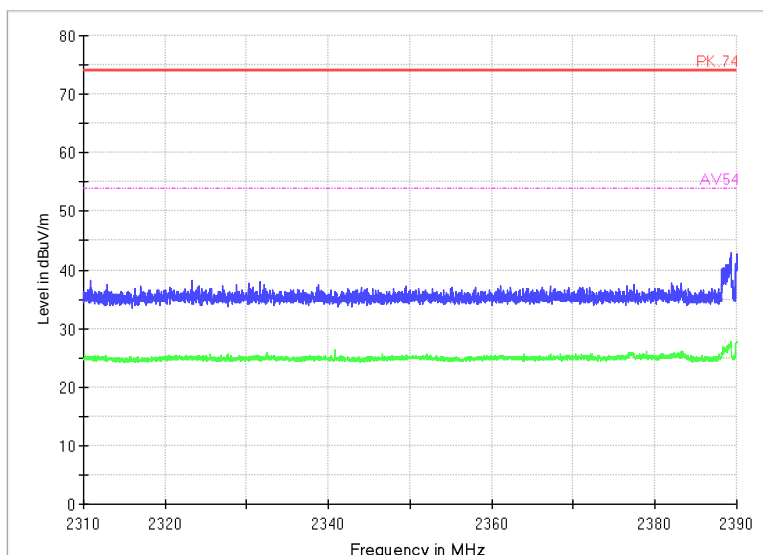


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11n(HT20)

Polarization: V



Radiated Emission Band Edge

Channel No.:1

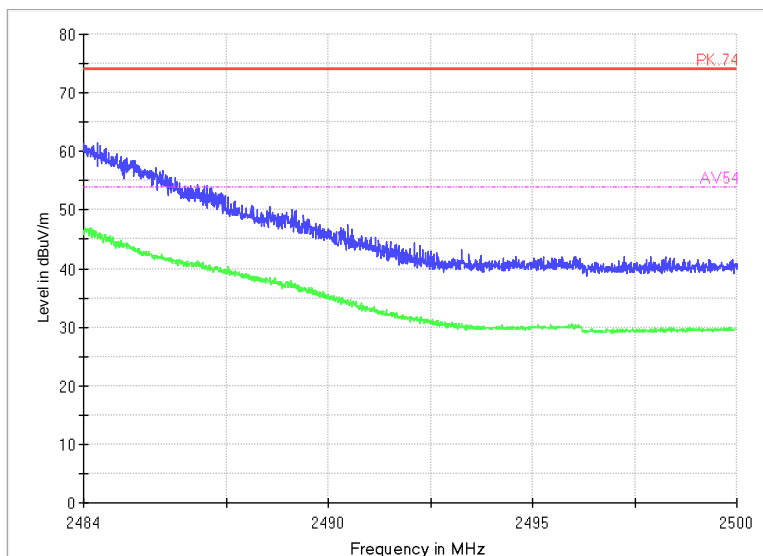
Test Mode: 802.11n(HT20)

Polarization: H



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Test Report No.: PSU-NQN2504150110RF07

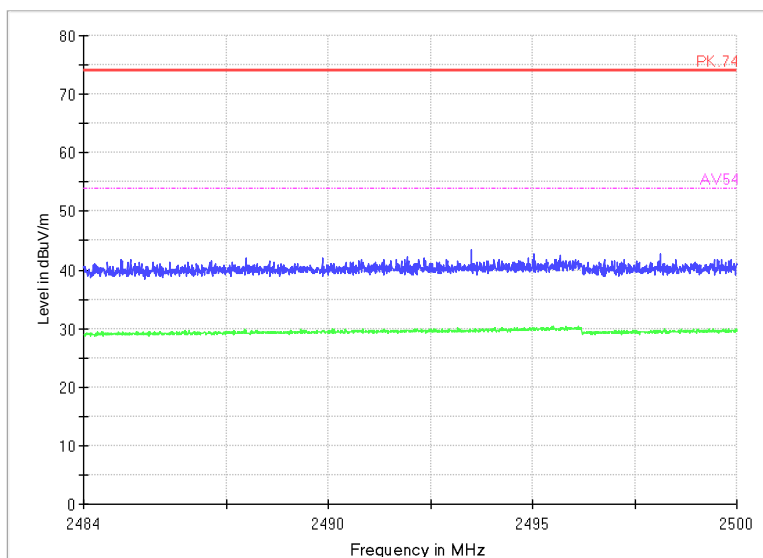


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11n(HT20)

Polarization: V



Radiated Emission Band Edge

Channel No.:11

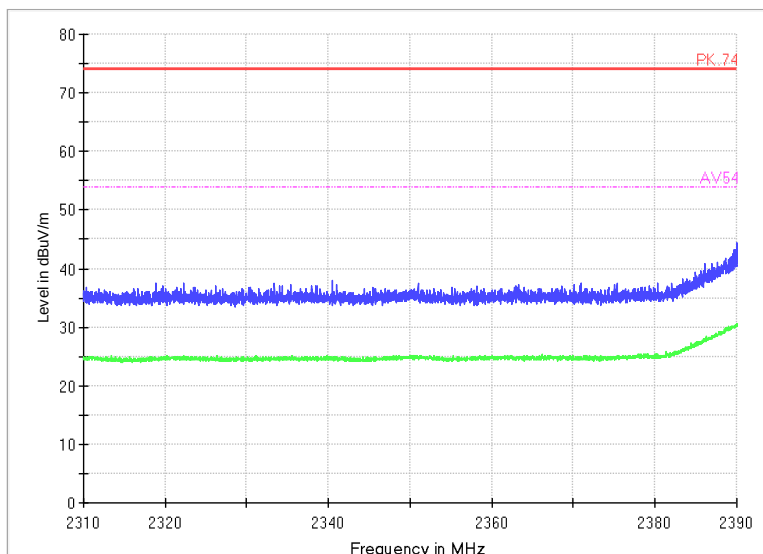
Test Mode: 802.11n(HT20)

Polarization: H



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Test Report No.: PSU-NQN2504150110RF07

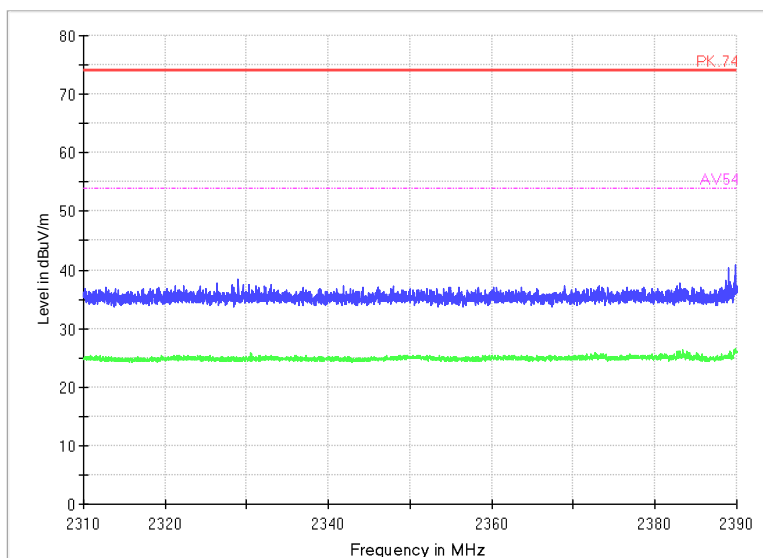


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11ax(HE20)

Polarization: V

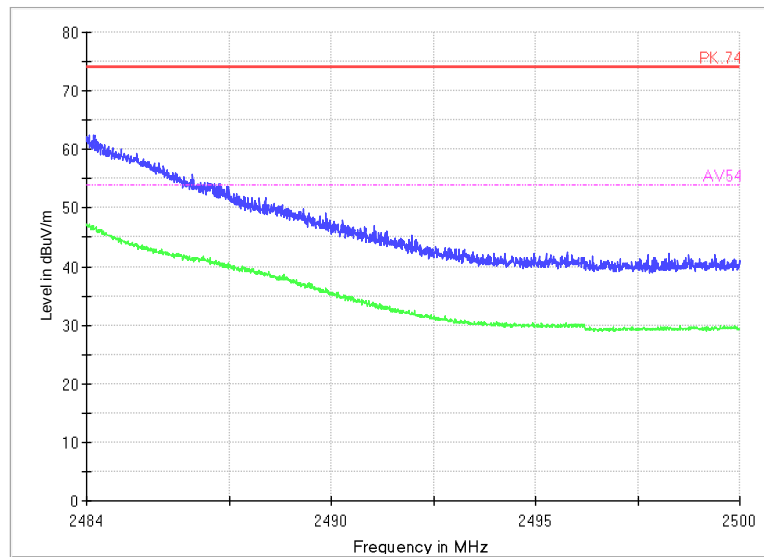


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11ax(HE20)

Polarization: H

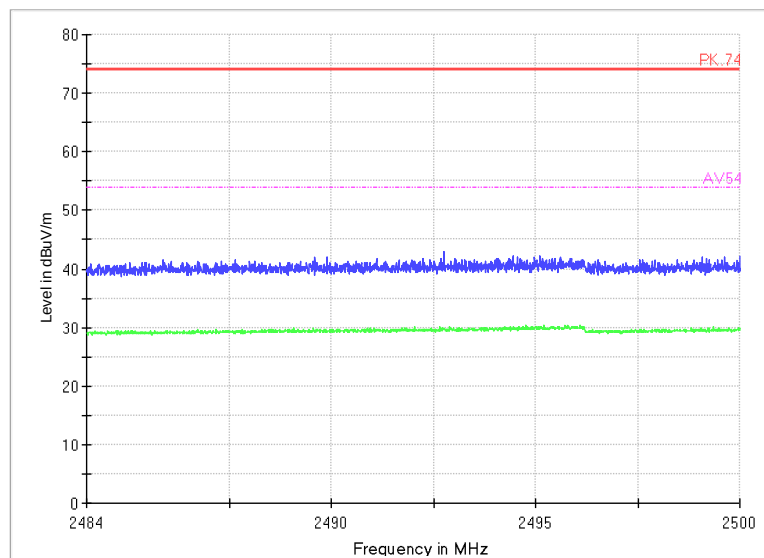


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11ax(HE20)

Polarization: V



Radiated Emission Band Edge

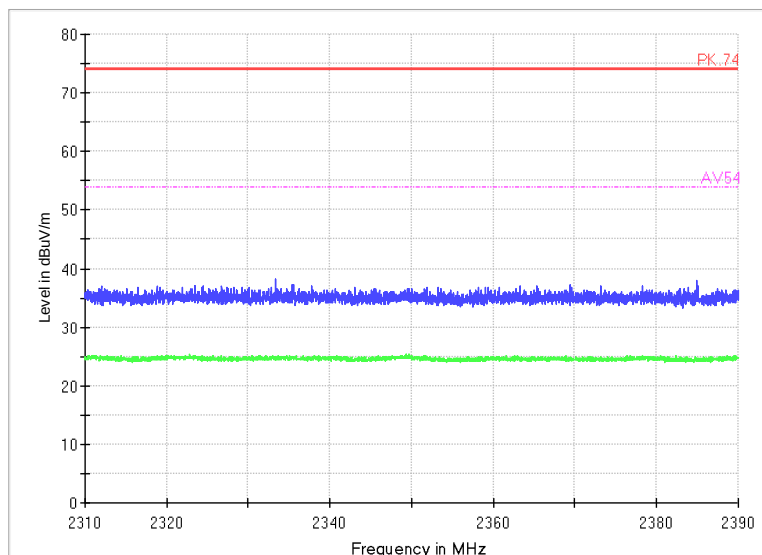
Channel No.:11

Test Mode: 802.11ax(HE20)

Polarization: H



Partial RU (Tone26)

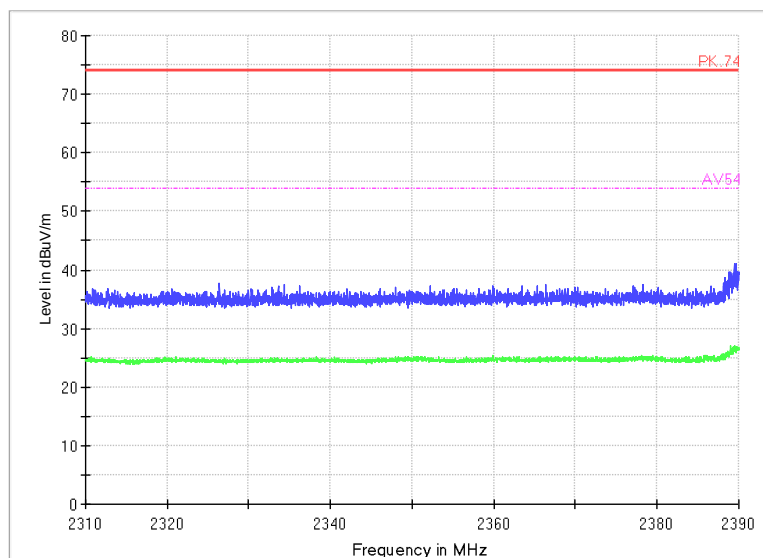


Radiated Emission Band Edge

Channel No.:1

Test Mode: 802.11ax(HE20)

Polarization: V



Radiated Emission Band Edge

Channel No.:1

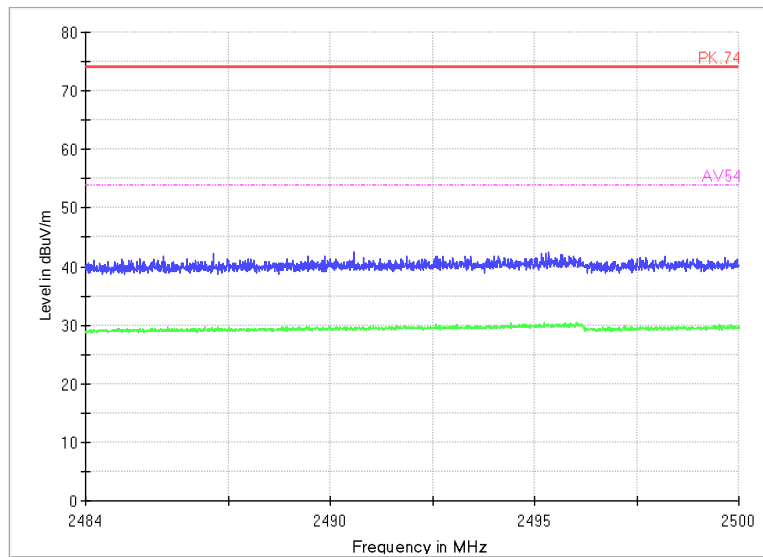
Test Mode: 802.11ax(HE20)

Polarization: H



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

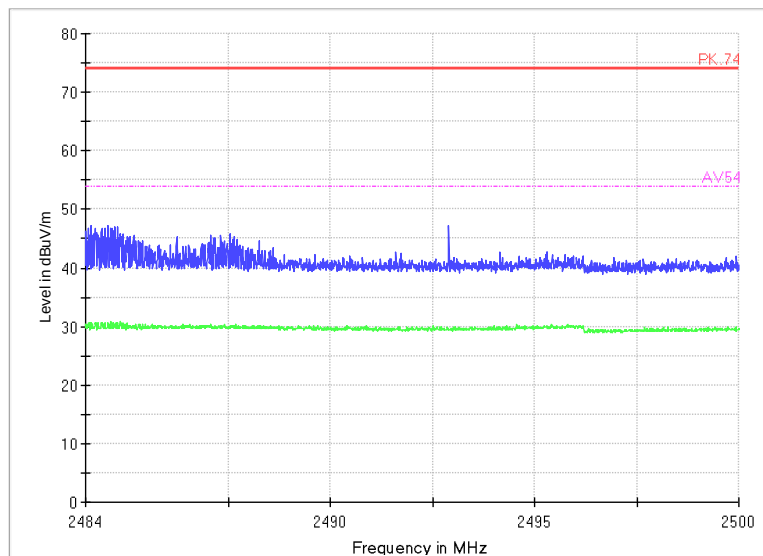


Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11ax(HE20)

Polarization: V



Radiated Emission Band Edge

Channel No.:11

Test Mode: 802.11ax(HE20)

Polarization: H

**Radiated Emission for WIFI**

After comparison, the worst case attitude is EUT lay down.

Determining Spurious Emissions Levels

A “reference path loss” is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

Result = $P_{mea} + A_{Rpl}$

Sample calculation: $(18.28 \text{ dB}\mu\text{V/m}) = (37.08 \text{ dB}\mu\text{V}) + (-18.8 \text{ dB/m})$, the corresponding frequency is 30.5335 MHz.

For 802.11b Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
30.194	18.28	-18.8	37.08	Vertical	40	21.72
77.6755	35.1	-22	57.1	Vertical	40	4.9
117.203	36.29	-18.6	54.89	Vertical	43.5	7.21
212.263	22.77	-17.1	39.87	Vertical	43.5	20.73
520.335	17.95	-8.8	26.75	Vertical	46	28.05
894.6095	19.79	-2.5	22.29	Vertical	46	26.21

For 802.11g Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.6745	19.57	-18.4	37.97	Vertical	40	20.43
77.724	35.72	-22	57.72	Vertical	40	4.28
117.203	36.11	-18.6	54.71	Vertical	43.5	7.39
208.48	23.33	-17.2	40.53	Vertical	43.5	20.17
550.211	16.45	-8.2	24.65	Vertical	46	29.55
879.4775	19.91	-2.3	22.21	Vertical	46	26.09

For 802.11n(HT20) Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
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36.305	20.12	-18.2	38.32	Vertical	40	19.88
77.7725	35.8	-22	57.8	Vertical	40	4.2
117.591	35.72	-18.8	54.52	Vertical	43.5	7.78
209.256	22.8	-17.2	40	Vertical	43.5	20.7
520.238	17.61	-8.8	26.41	Vertical	46	28.39
877.4405	19.73	-2.3	22.03	Vertical	46	26.27

For 802.11ax(HE20) Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.917	20.02	-18.3	38.32	Vertical	40	19.98
77.724	35.45	-22	57.45	Vertical	40	4.55
116.8635	35.93	-18.6	54.53	Vertical	43.5	7.57
205.1335	23.17	-17.1	40.27	Vertical	43.5	20.33
518.977	17.62	-8.8	26.42	Vertical	46	28.38
898.1015	19.43	-2.5	21.93	Vertical	46	26.57

For 802.11b Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.208	20.12	-18.2	38.32	Vertical	40	19.88
77.7725	35.72	-22	57.72	Vertical	40	4.28
117.7365	35.57	-18.8	54.37	Vertical	43.5	7.93
205.3275	23.2	-17.2	40.4	Vertical	43.5	20.3
521.2565	17.42	-8.8	26.22	Vertical	46	28.58
863.2785	19.36	-2.5	21.86	Vertical	46	26.64

For 802.11g Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.208	19.78	-18.2	37.98	Vertical	40	20.22
77.6755	34.5	-22	56.5	Vertical	40	5.5
117.203	35.79	-18.6	54.39	Vertical	43.5	7.71
210.3715	21.89	-17.2	39.09	Vertical	43.5	21.61

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534.206	17.55	-8.6	26.15	Vertical	46	28.45
881.9025	19.68	-2.3	21.98	Vertical	46	26.32

For 802.11n(HT20) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.917	16.29	-18.3	34.59	Vertical	40	23.71
77.7725	34.1	-22	56.1	Vertical	40	5.9
117.397	34.67	-18.7	53.37	Vertical	43.5	8.83
210.129	21.31	-17.2	38.51	Vertical	43.5	22.19
534.303	16.7	-8.6	25.3	Vertical	46	29.3
870.893	18.61	-2.4	21.01	Vertical	46	27.39

For 802.11ax(HE20) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.626	19.74	-18.4	38.14	Vertical	40	20.26
77.724	33.93	-22	55.93	Vertical	40	6.07
117.106	35.52	-18.6	54.12	Vertical	43.5	7.98
209.935	23.49	-17.2	40.69	Vertical	43.5	20.01
521.111	16.99	-8.8	25.79	Vertical	46	29.01
918.132	19.44	-1.8	21.24	Vertical	46	26.56

For 802.11b Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.8685	20.31	-18.3	38.61	Vertical	40	19.69
77.821	34.55	-22.1	56.65	Vertical	40	5.45
117.591	35.36	-18.8	54.16	Vertical	43.5	8.14
209.3045	23.53	-17.2	40.73	Vertical	43.5	19.97
515.8245	16.71	-8.9	25.61	Vertical	46	29.29
918.423	19.4	-1.8	21.2	Vertical	46	26.6

For 802.11g Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl	Pmea	Polarity	Limit	Margin
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BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

		(dB)	(dBuV/m)		(dBuV/m)	(dB)
36.499	19.64	-18.1	37.74	Vertical	40	20.36
77.724	34.03	-22	56.03	Vertical	40	5.97
117.1545	35.57	-18.6	54.17	Vertical	43.5	7.93
209.4985	23.76	-17.2	40.96	Vertical	43.5	19.74
511.993	16.01	-9	25.01	Vertical	46	29.99
882.6785	19.58	-2.3	21.88	Vertical	46	26.42

For 802.11n(HT20) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
35.9655	20.15	-18.3	38.45	Vertical	40	19.85
77.3845	33.77	-22	55.77	Vertical	40	6.23
117.1545	35.6	-18.6	54.2	Vertical	43.5	7.9
209.353	23.75	-17.2	40.95	Vertical	43.5	19.75
523.342	16.61	-8.7	25.31	Vertical	46	29.39
884.764	19.55	-2.3	21.85	Vertical	46	26.45

For 802.11ax(HE20) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.014	19.91	-18.3	38.21	Vertical	40	20.09
77.6755	33.27	-22	55.27	Vertical	40	6.73
117.494	35.05	-18.7	53.75	Vertical	43.5	8.45
207.607	23	-17.2	40.2	Vertical	43.5	20.5
524.894	16.56	-8.7	25.26	Vertical	46	29.44
905.231	19.12	-2.4	21.52	Vertical	46	26.88

**Partial RU (Tone26)**

For 802.11ax(HE20) Channel No.:1

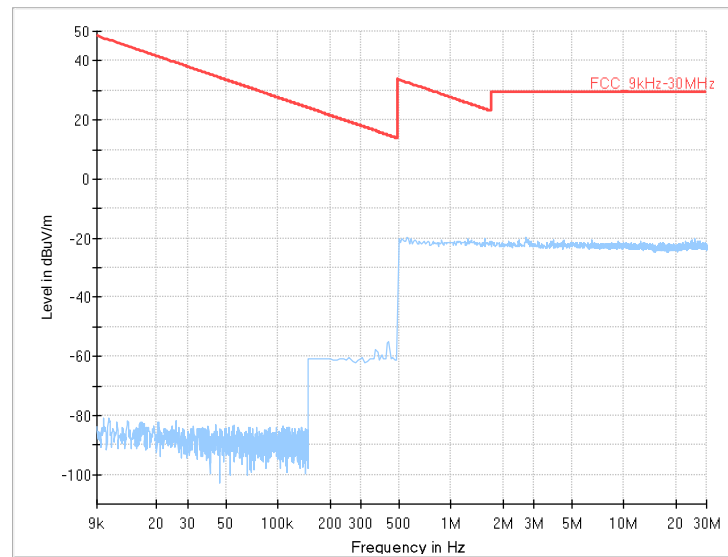
Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.208	20.09	-18.2	38.29	Vertical	40	19.91
77.821	33.99	-22.1	56.09	Vertical	40	6.01
116.912	35.25	-18.6	53.85	Vertical	43.5	8.25
209.5955	23.51	-17.2	40.71	Vertical	43.5	19.99
518.007	16.97	-8.8	25.77	Vertical	46	29.03
895.0945	19.36	-2.5	21.86	Vertical	46	26.64

For 802.11ax(HE20) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.305	20	-18.2	38.2	Vertical	40	20
77.724	33.84	-22	55.84	Vertical	40	6.16
117.397	34.94	-18.7	53.64	Vertical	43.5	8.56
209.838	23.13	-17.2	40.33	Vertical	43.5	20.37
520.3835	16.92	-8.8	25.72	Vertical	46	29.08
933.458	19.23	-1.7	20.93	Vertical	46	26.77

For 802.11ax(HE20) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)	Margin (dB)
36.305	19.84	-18.2	38.04	Vertical	40	20.16
77.821	33.82	-22.1	55.92	Vertical	40	6.18
116.9605	35.08	-18.6	53.68	Vertical	43.5	8.42
209.547	23.04	-17.2	40.24	Vertical	43.5	20.46
518.977	17.05	-8.8	25.85	Vertical	46	28.95
937.338	19.19	-1.8	20.99	Vertical	46	26.81



Frequency Range: 9kHz -30MHz

Detector: QP mode

Note: The relevant tests have been performed in order to verify in which mode would have the worst features, the result show above is the worst case.

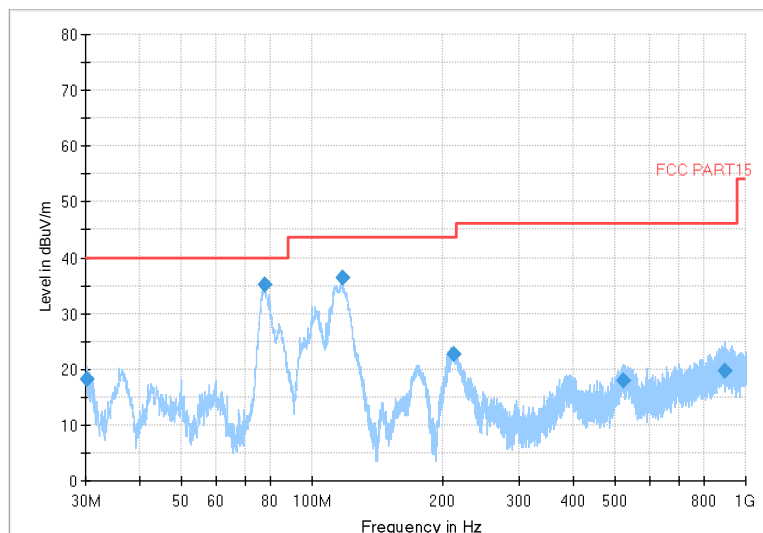


BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Carrier frequency (MHz): 2412

Channel No.:1

Full Spectrum

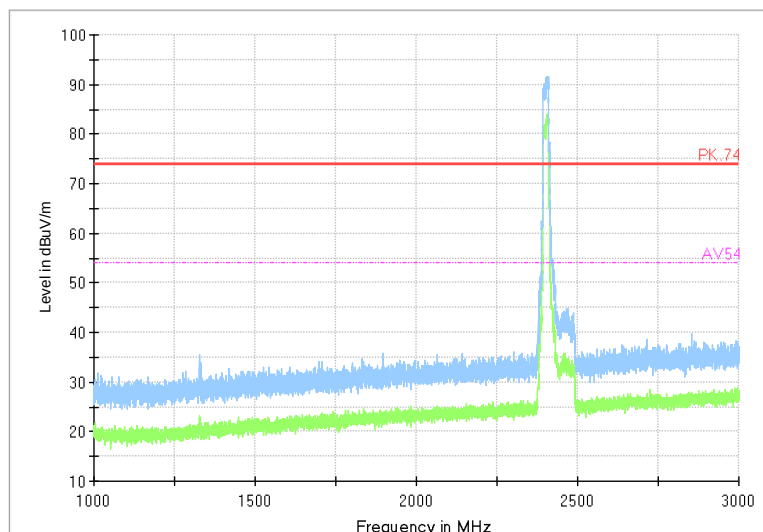


Frequency Range 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

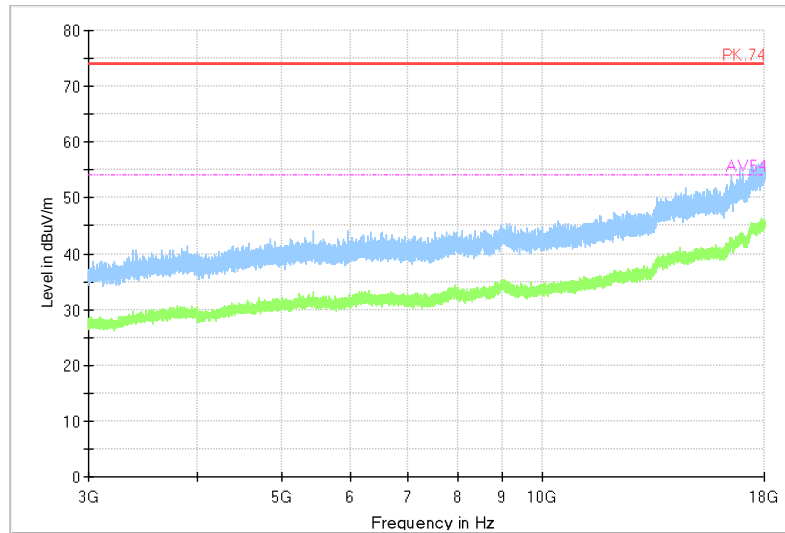
Modulation type: 802.11b



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Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

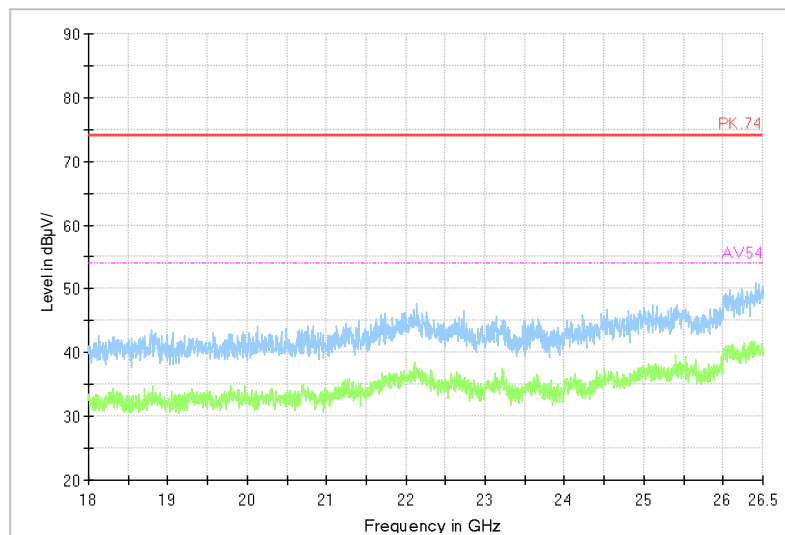


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

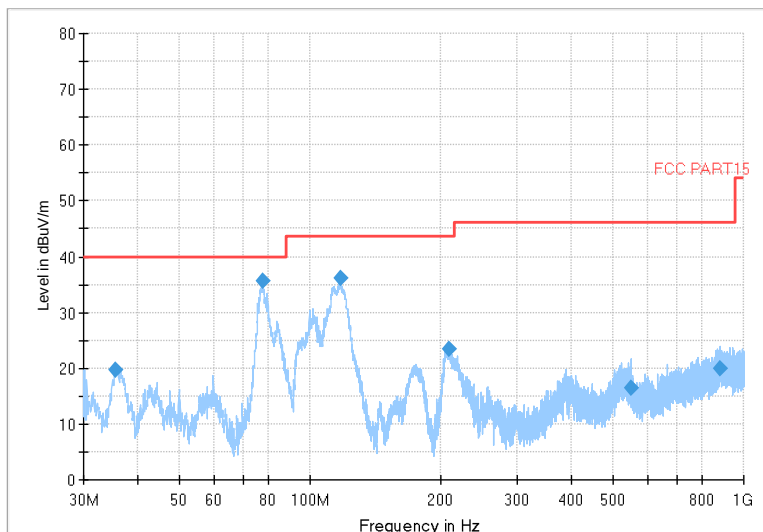
Modulation type: 802.11b



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

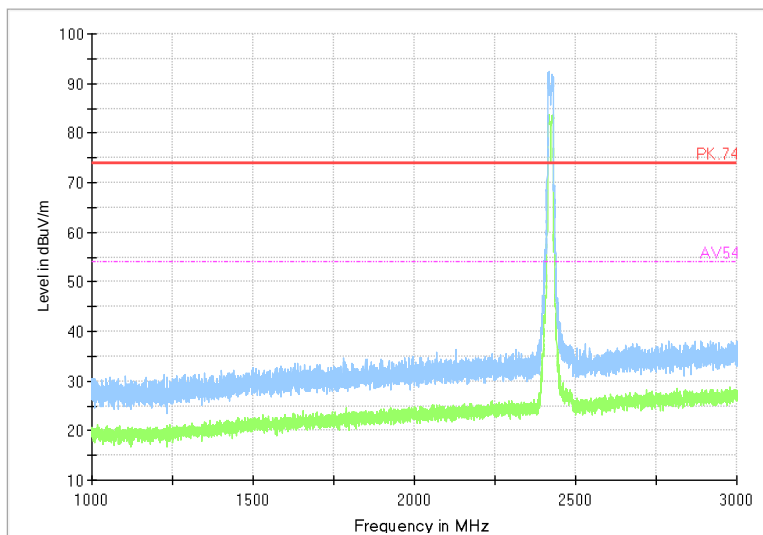


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

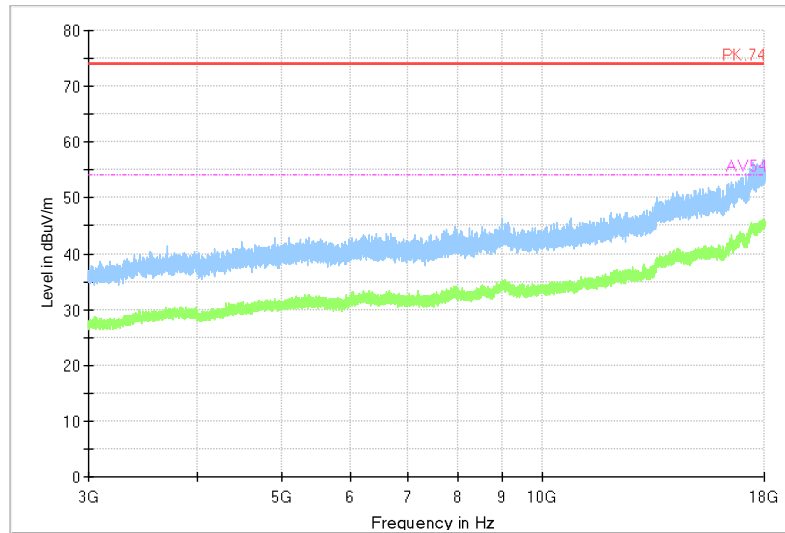
Modulation type: 802.11g



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

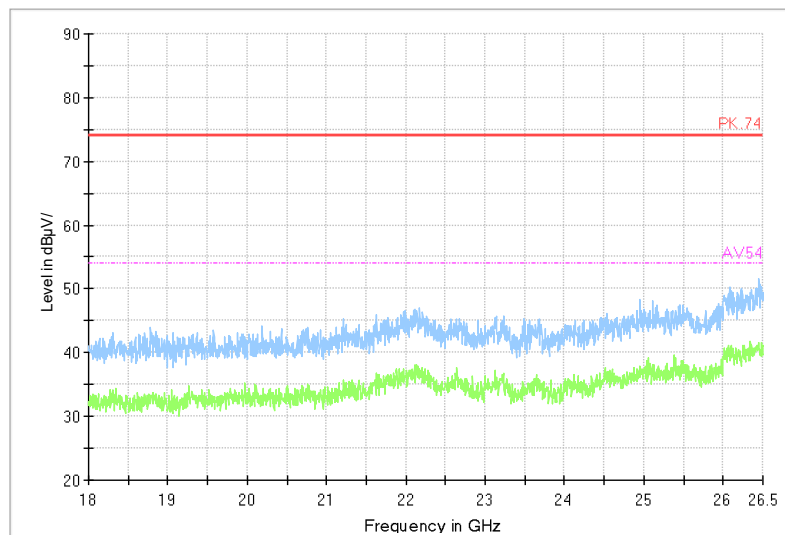


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

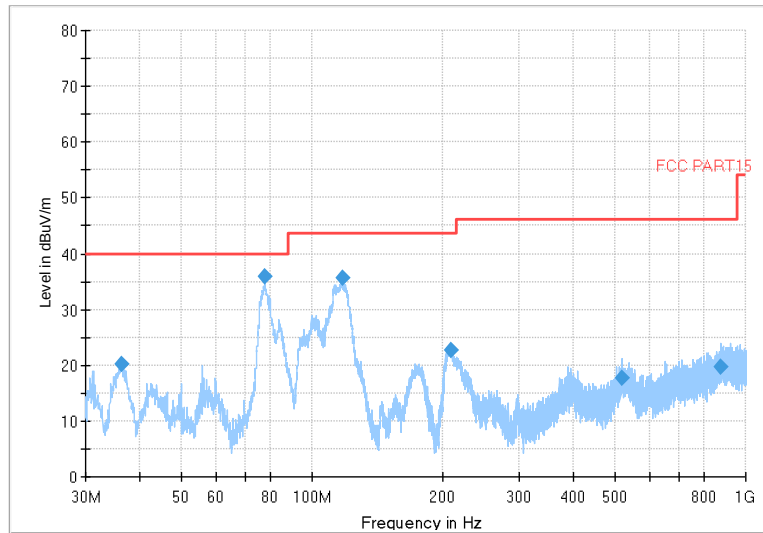
Modulation type: 802.11g



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

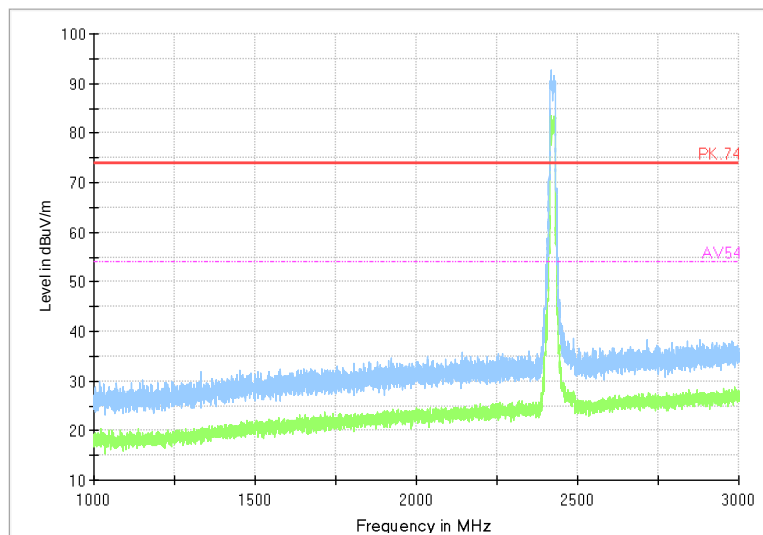


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

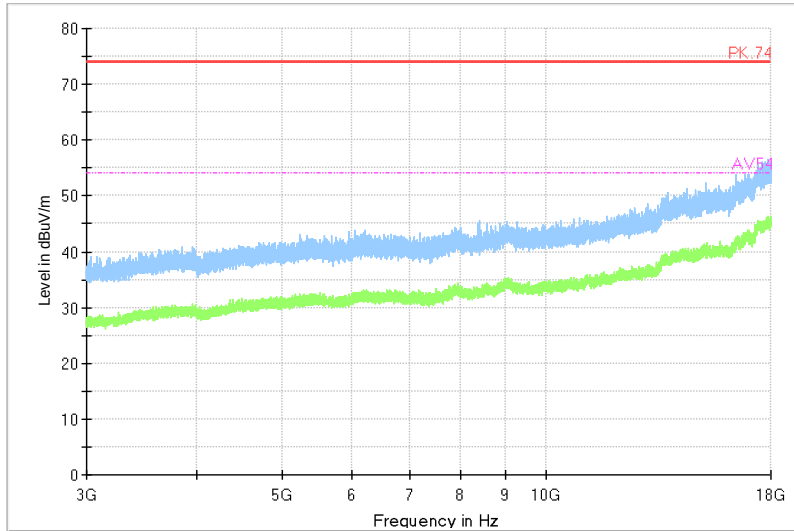
Modulation type: 802.11n(HT20)



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VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

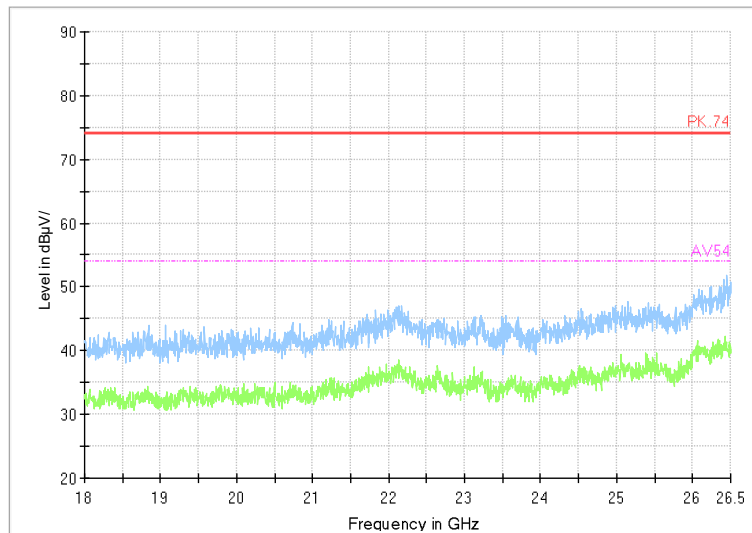


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

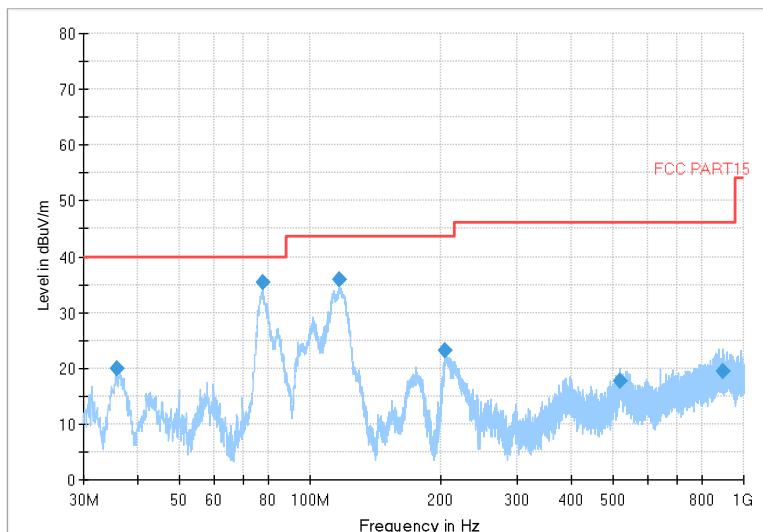
Modulation type: 802.11n(HT20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

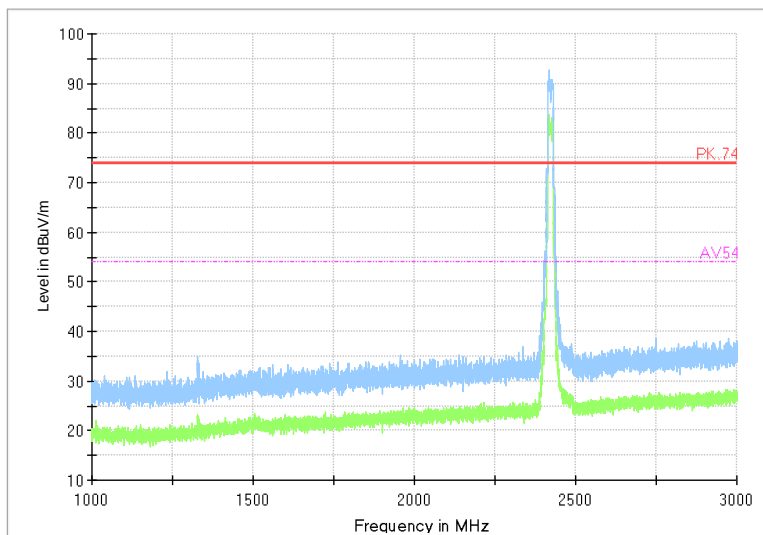


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

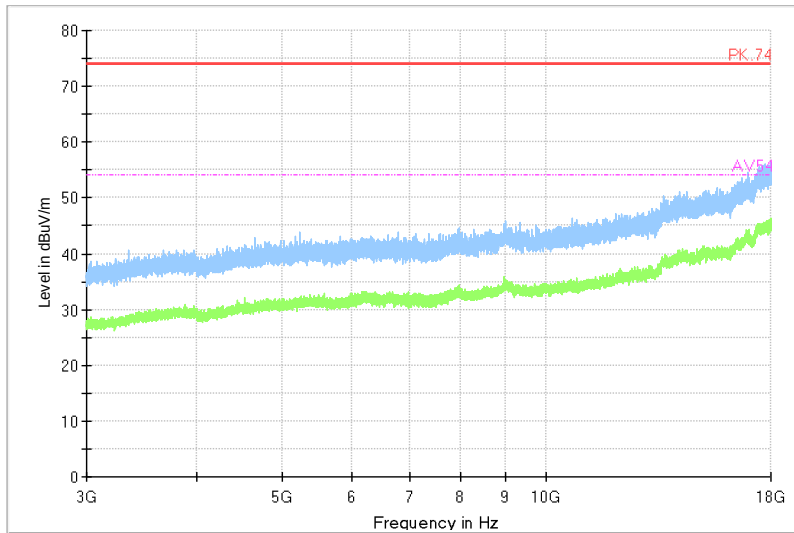
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

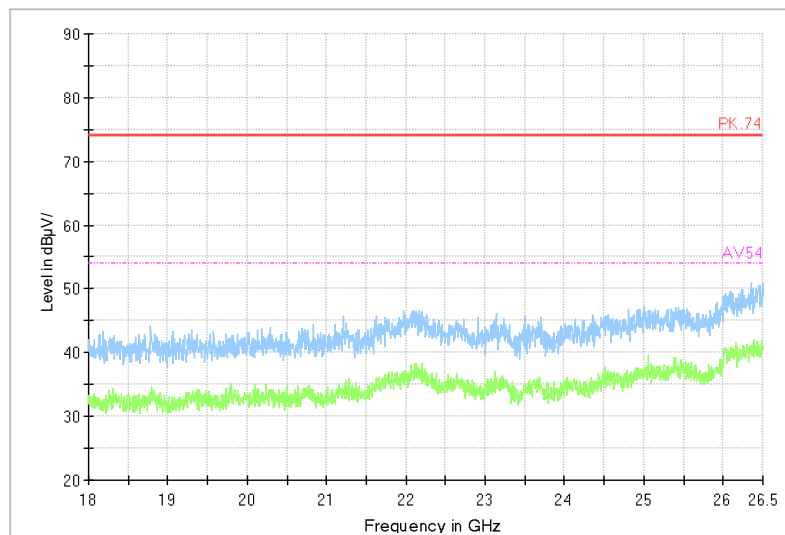


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)



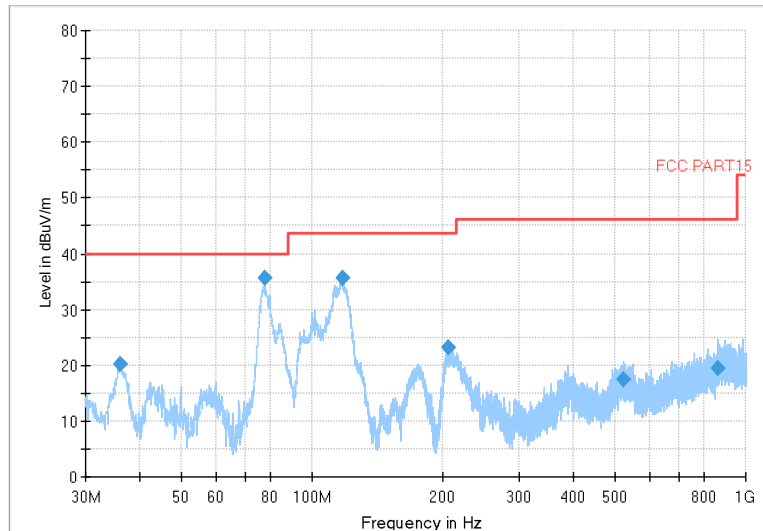
BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Carrier frequency (MHz): 2437

Channel No.:6

Full Spectrum

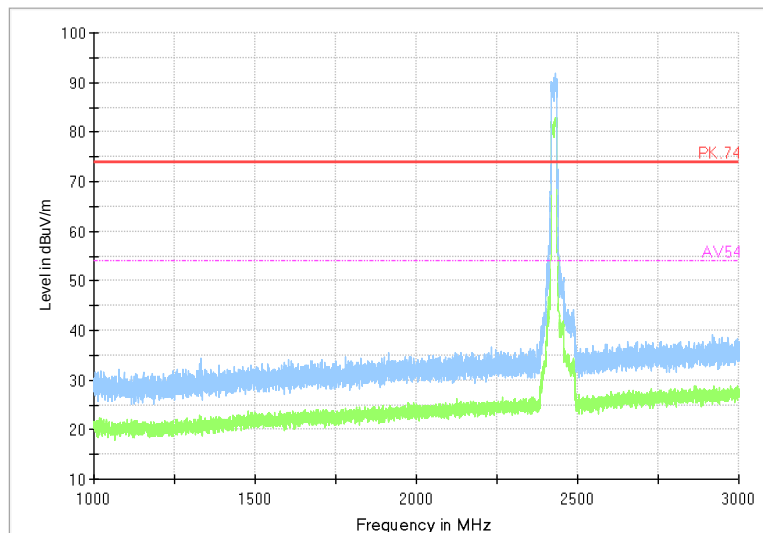


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

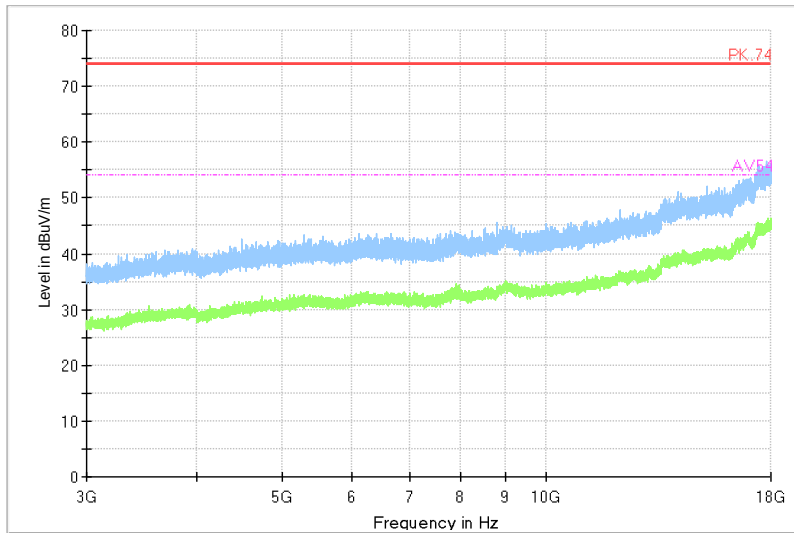
Modulation type: 802.11b



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

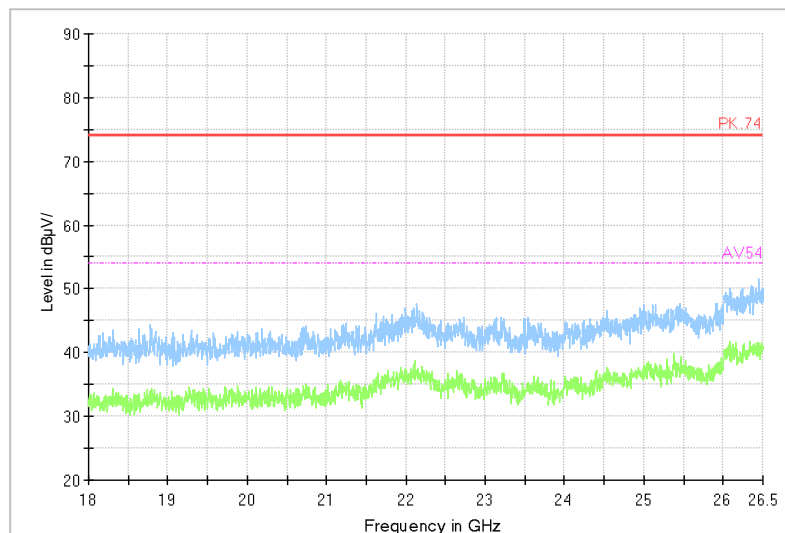


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

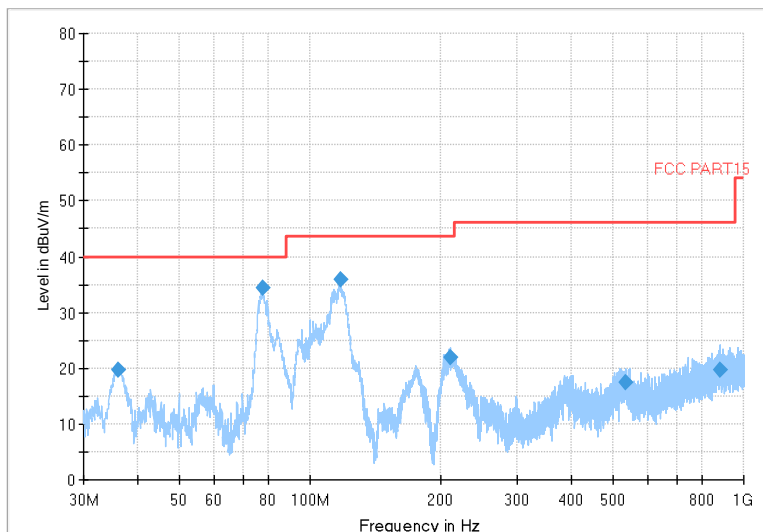
Modulation type: 802.11b



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

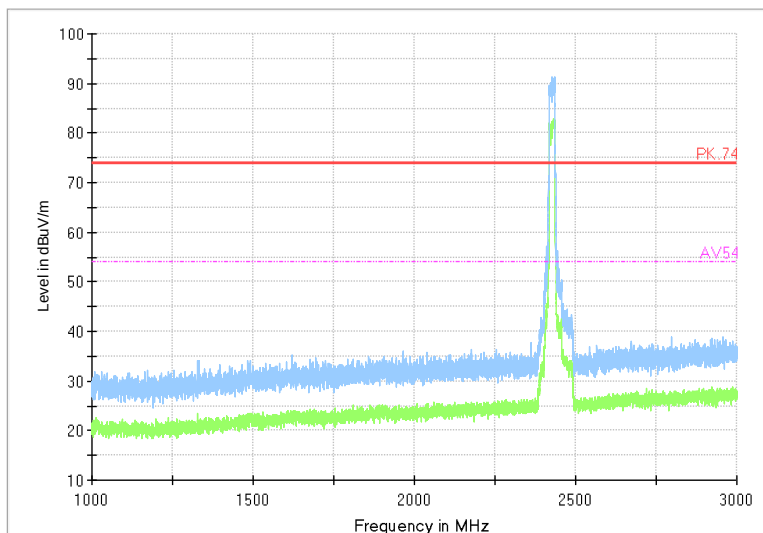


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

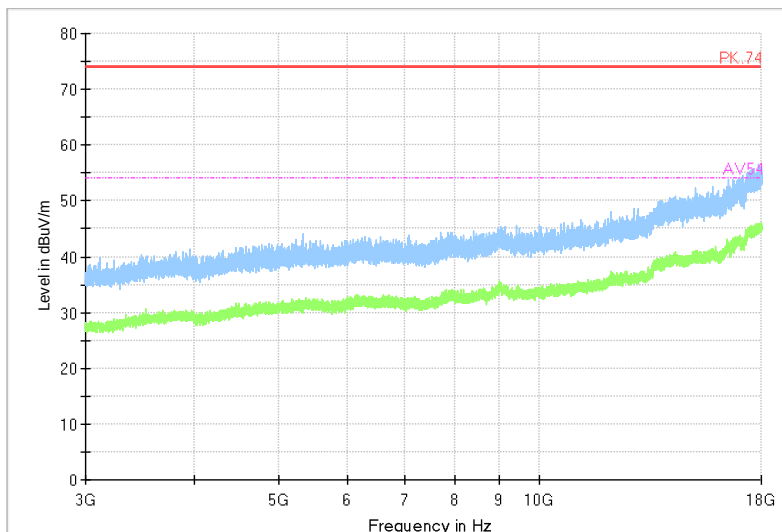
Modulation type: 802.11g



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

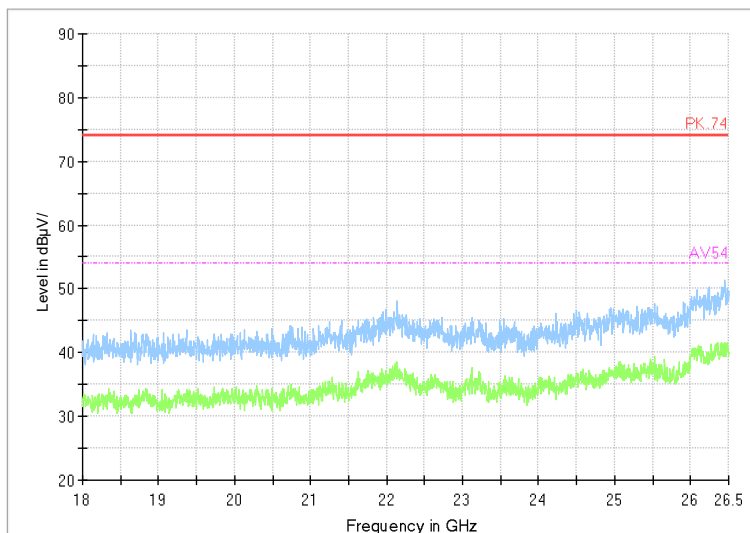


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

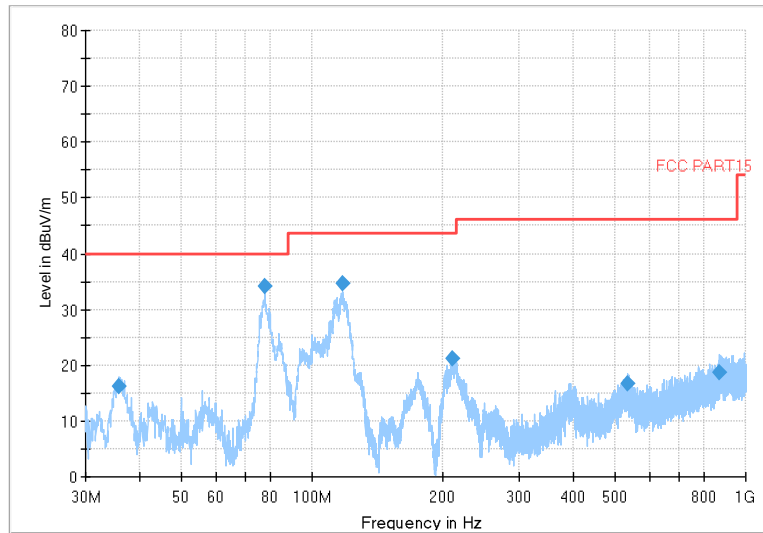
Modulation type: 802.11g



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

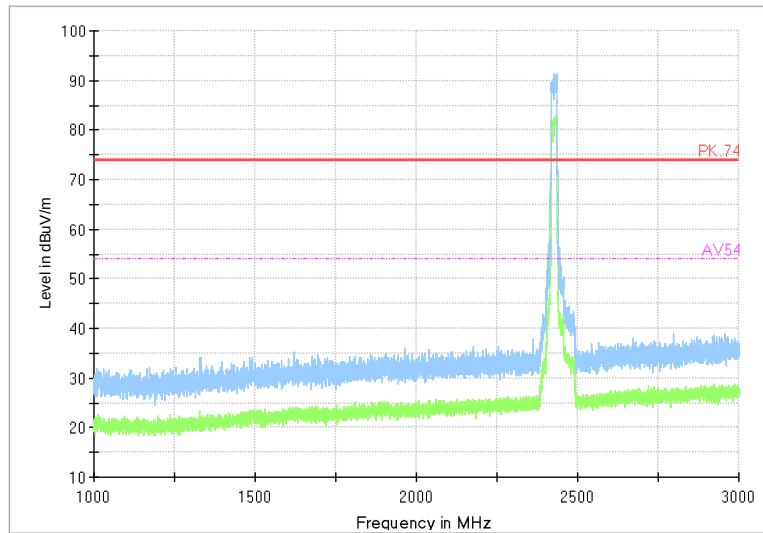


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

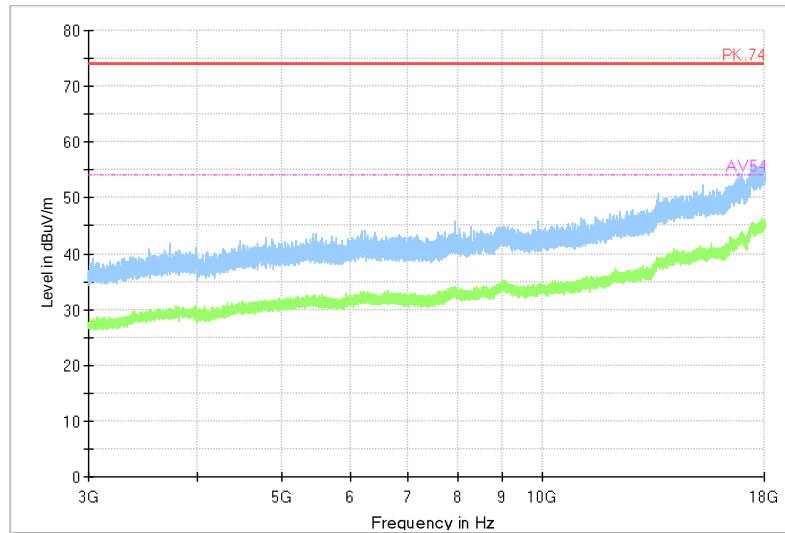
Modulation type: 802.11n(HT20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

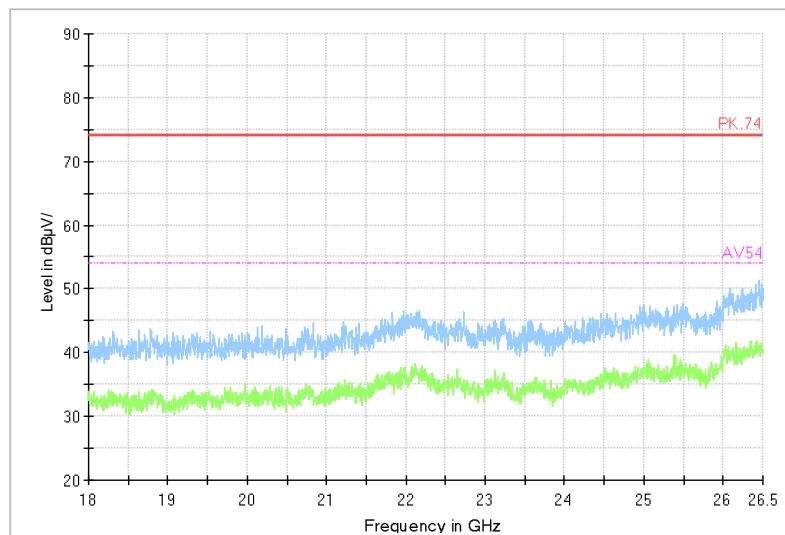


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

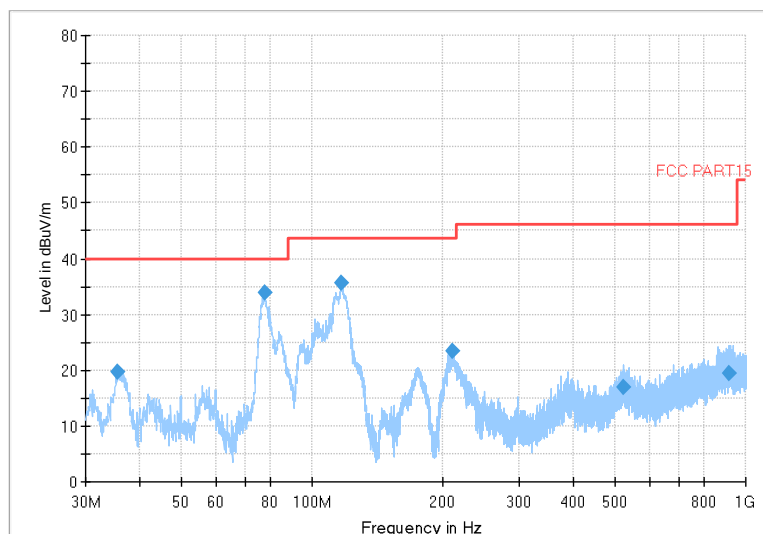
Modulation type: 802.11n(HT20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

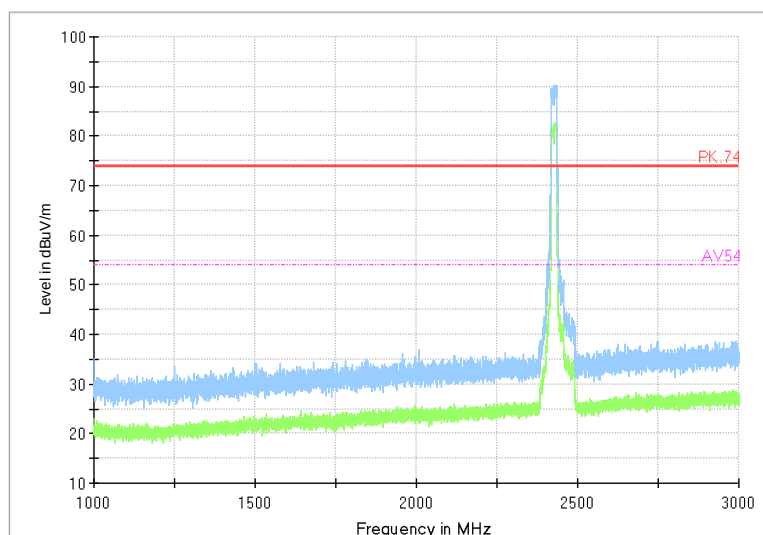


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

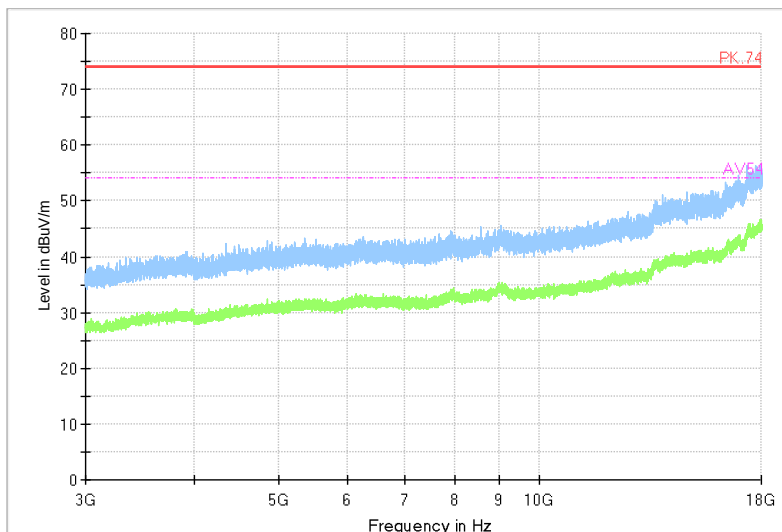
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

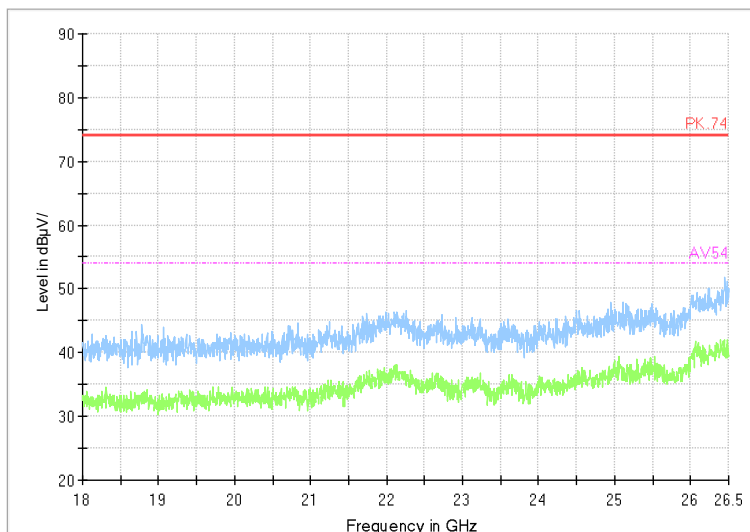


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

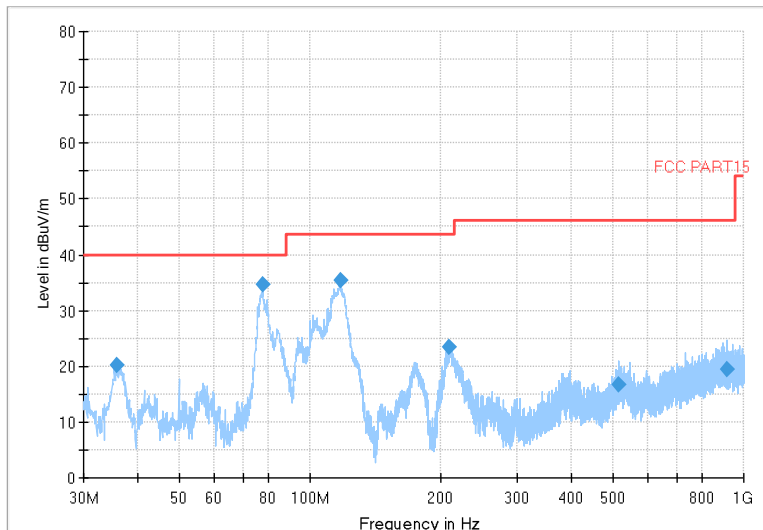


BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Carrier frequency (MHz): 2462

Channel No.:11

Full Spectrum

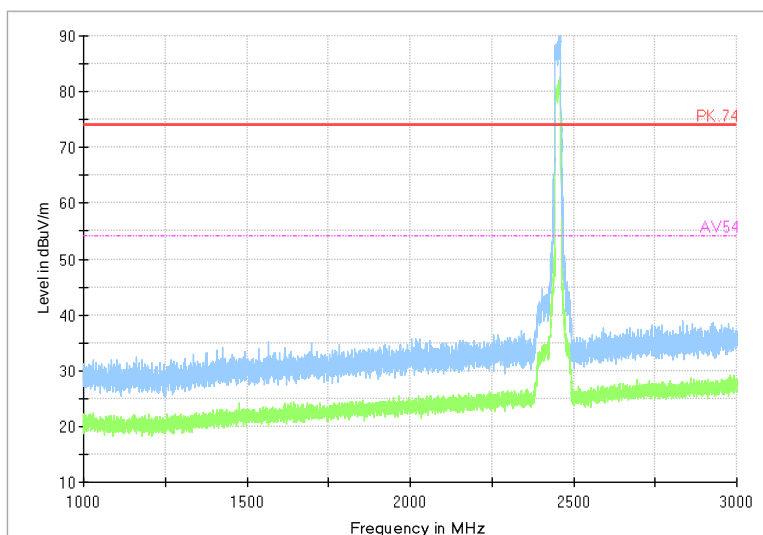


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

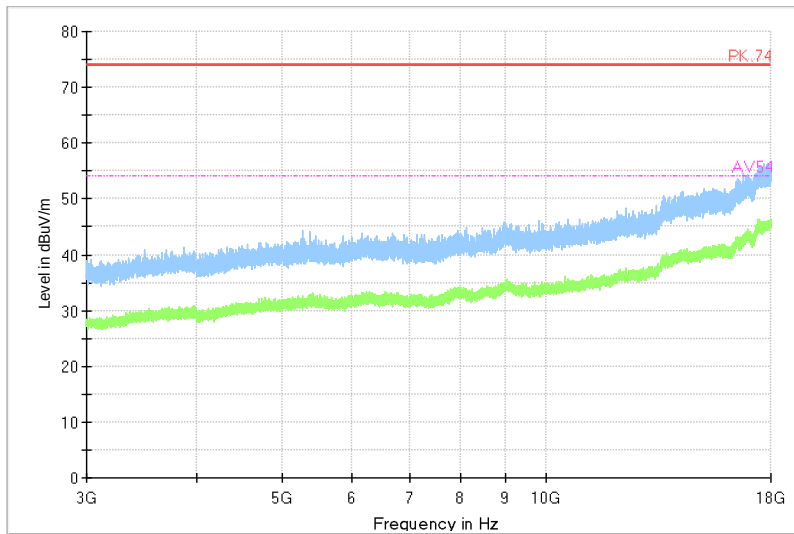
Modulation type: 802.11b



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

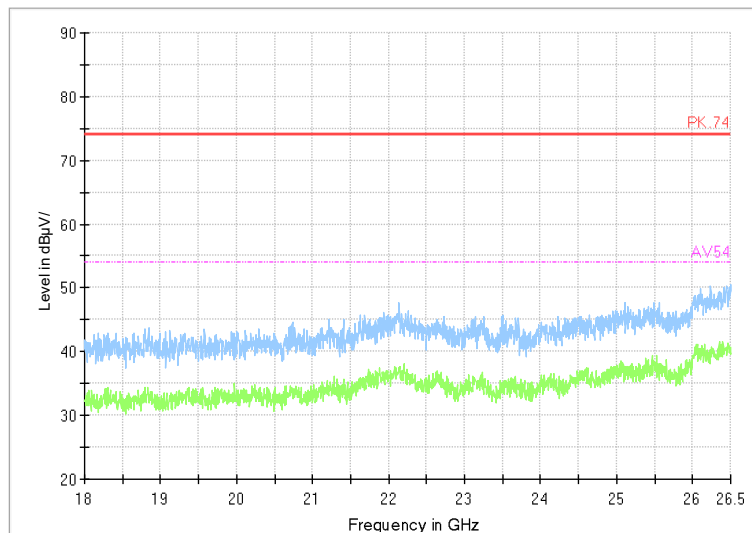


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

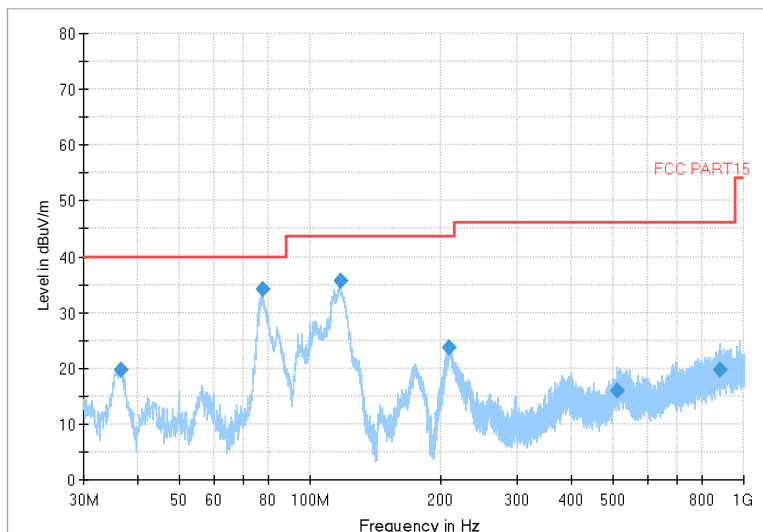
Modulation type: 802.11b



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

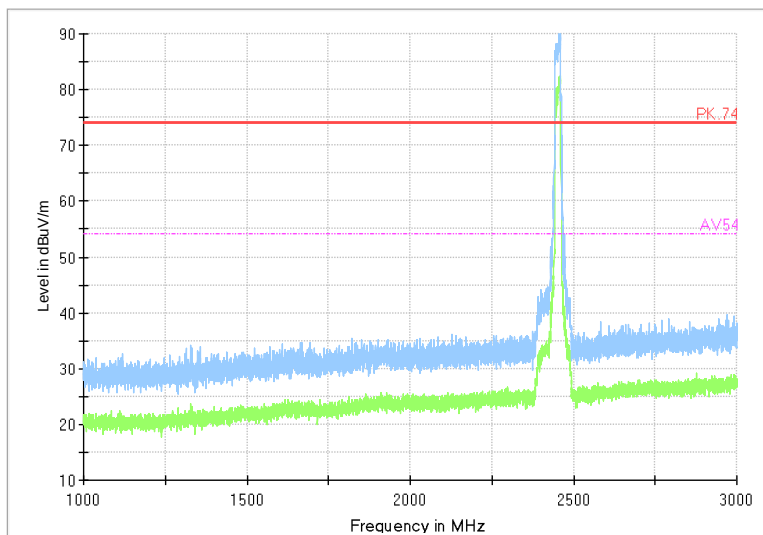


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

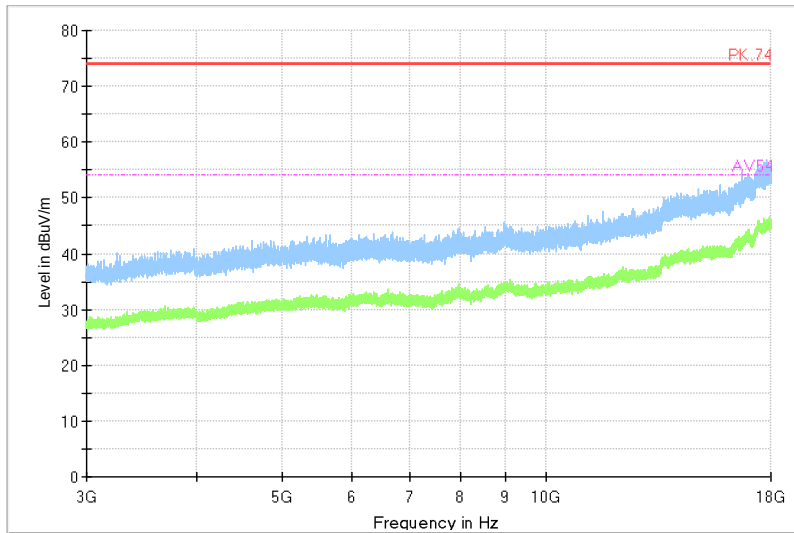
Modulation type: 802.11g



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

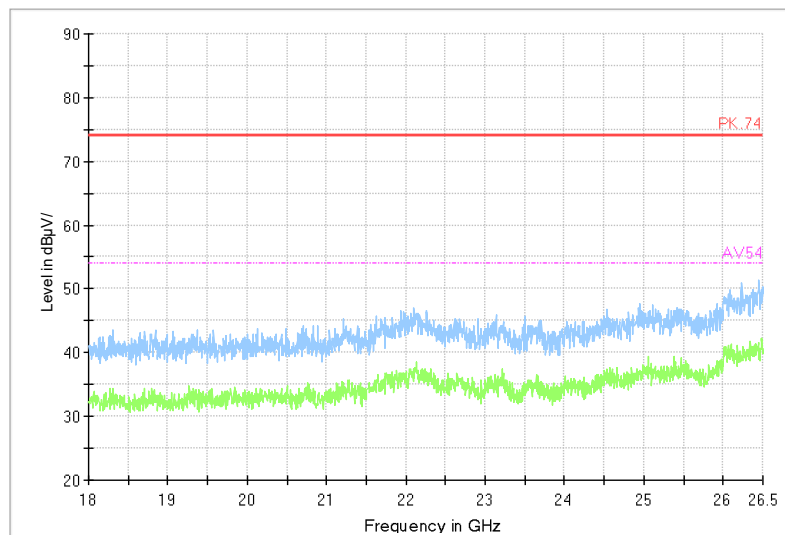


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

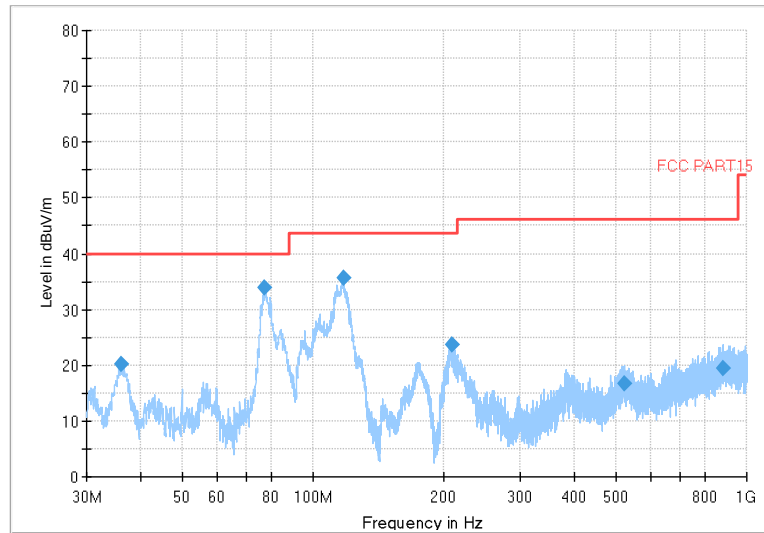
Modulation type: 802.11g



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

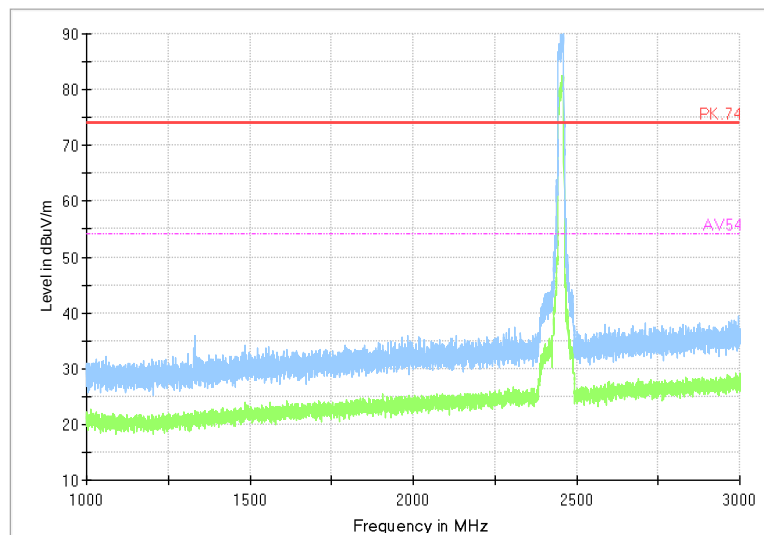


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

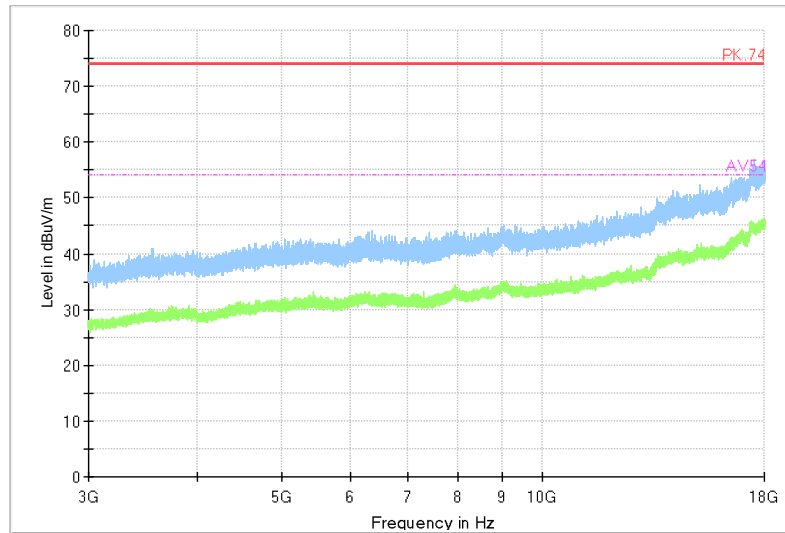
Modulation type: 802.11n(HT20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

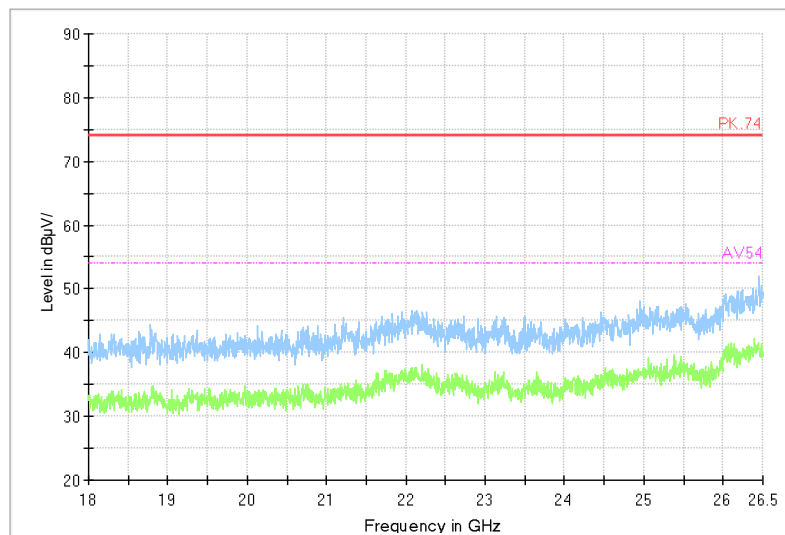


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11n(HT20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

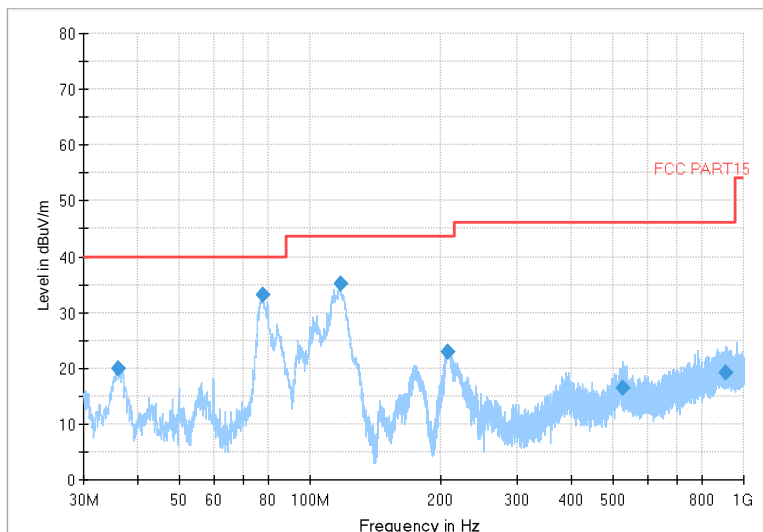
Modulation type: 802.11n(HT20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

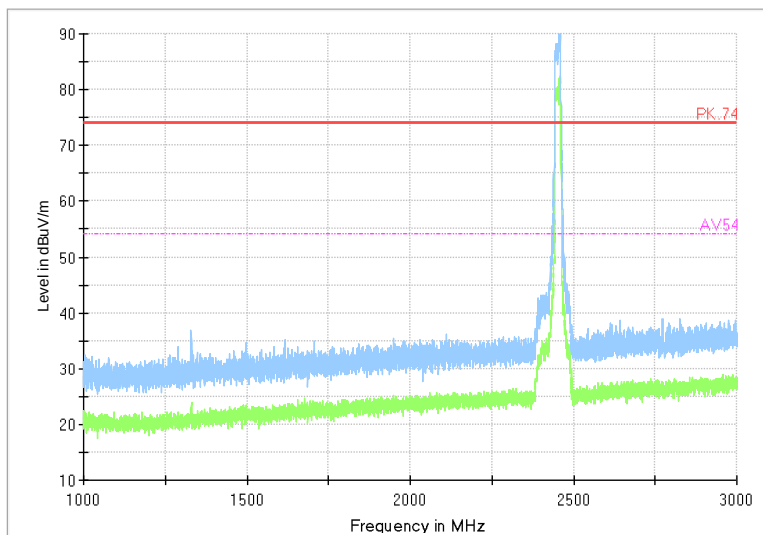


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

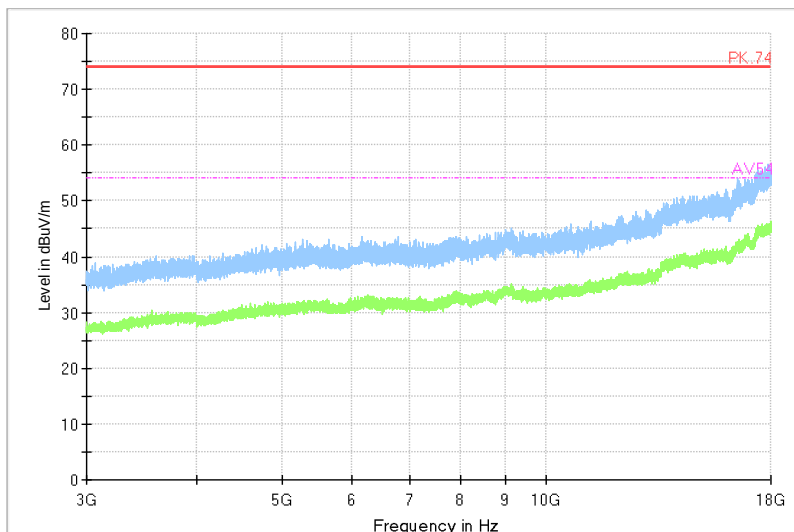
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

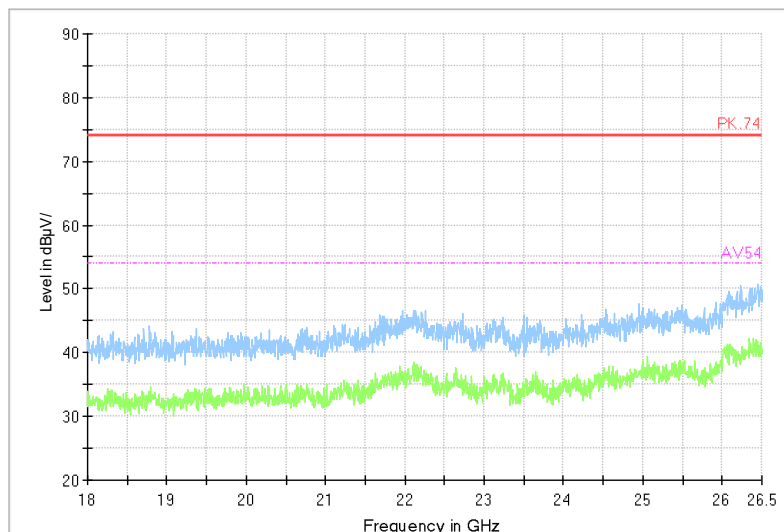


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)



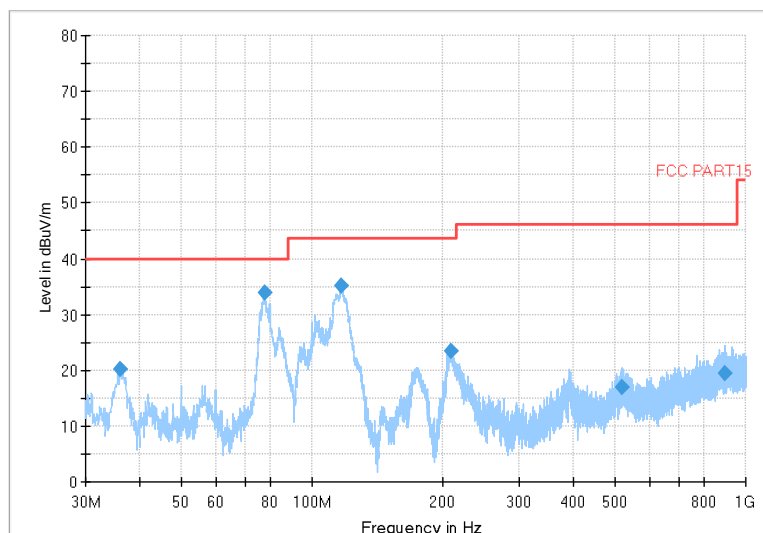
BUREAU VERITAS Test Report No.: PSU-NQN2504150110RF07

Partial RU (Tone26)

Carrier frequency (MHz): 2412

Channel No.:1

Full Spectrum

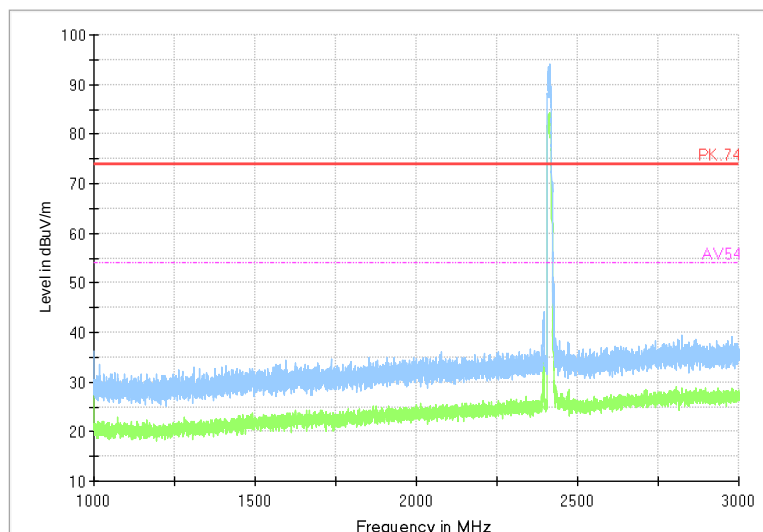


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

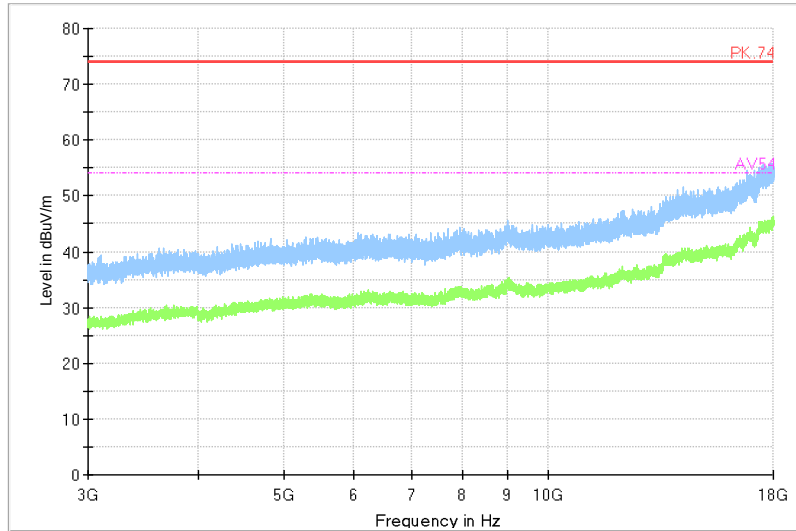
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

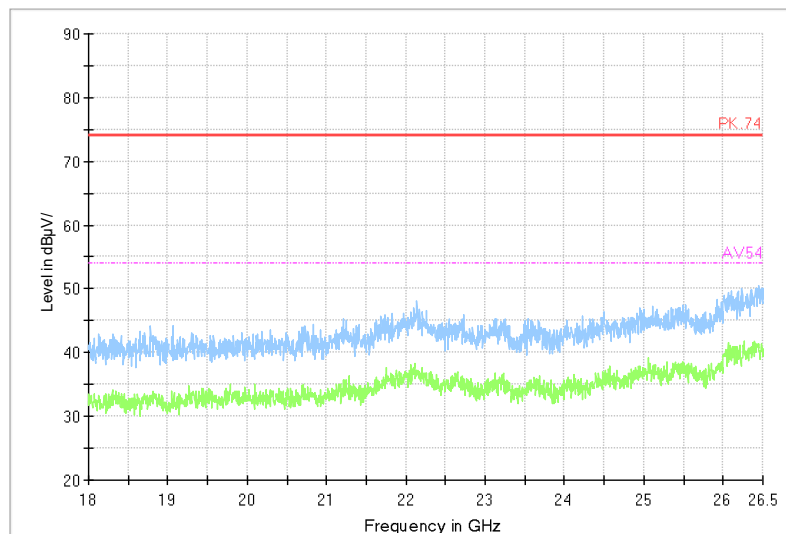
Test Report No.: PSU-NQN2504150110RF07

Full Spectrum



Frequency Range: 3GHz -18GHz
Detector: Av mode and PK mode
Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz
Detector: Av mode and PK mode
Modulation type: 802.11 ax(HE20)



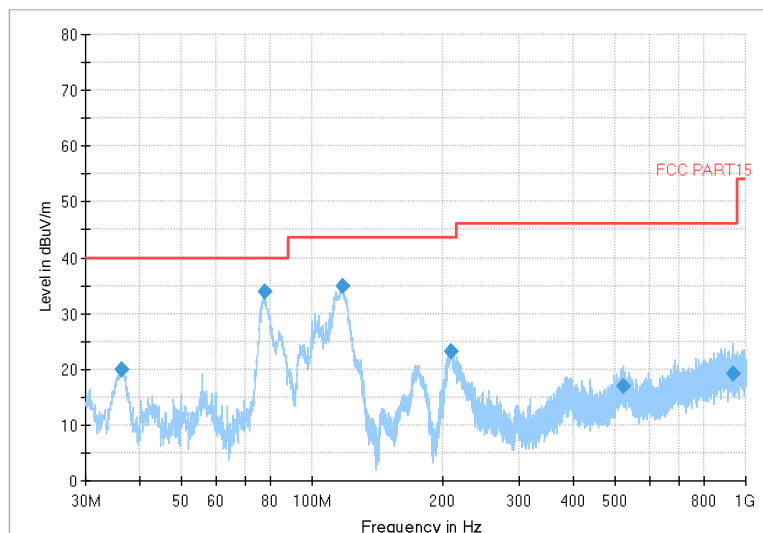
BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Carrier frequency (MHz): 2437

Channel No.:6

Full Spectrum

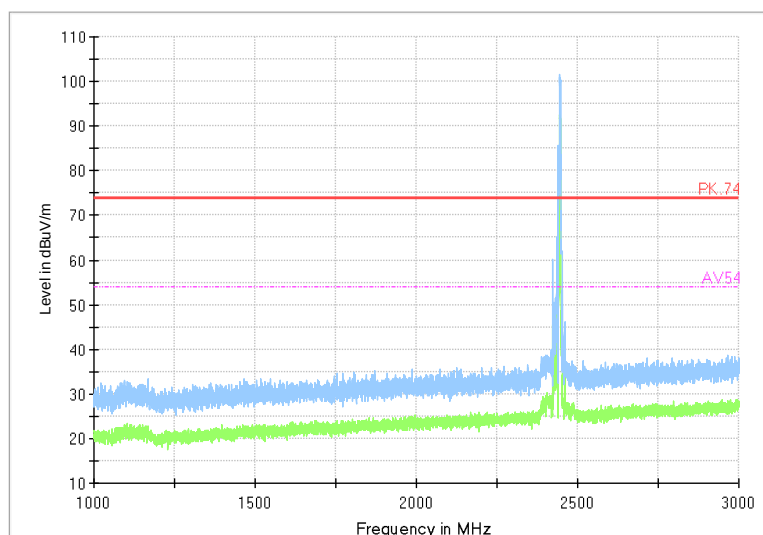


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

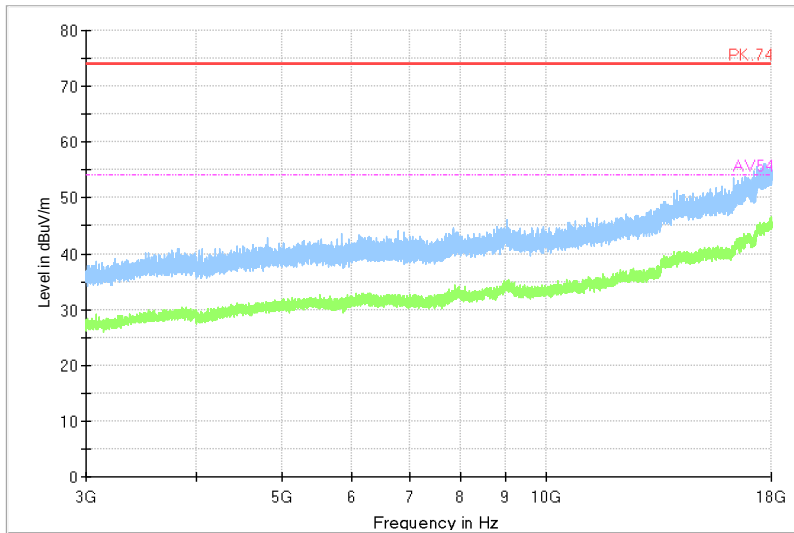
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

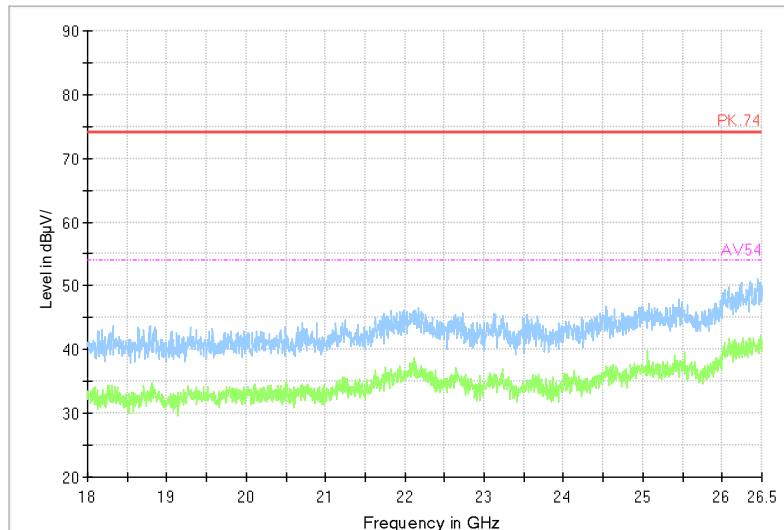


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)



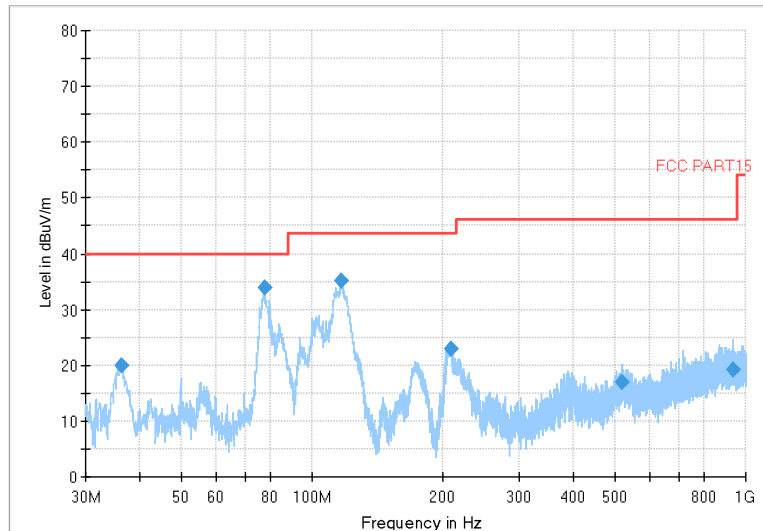
BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Carrier frequency (MHz): 2462

Channel No.:11

Full Spectrum

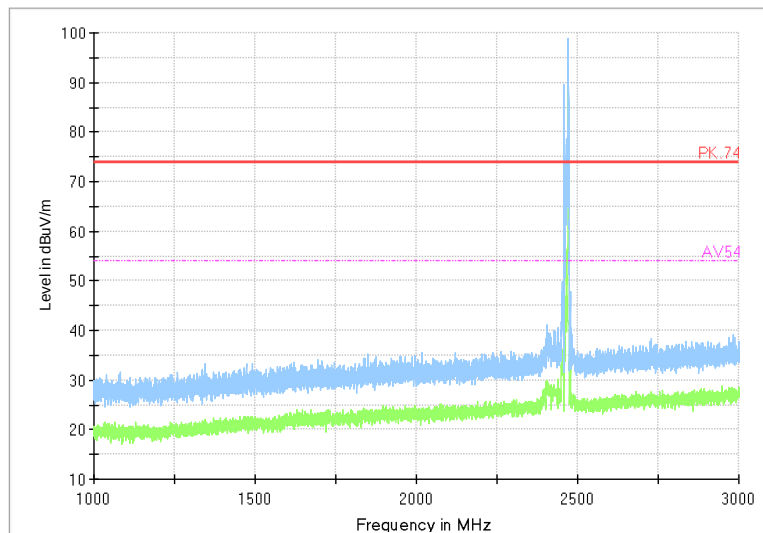


Frequency Range: 30MHz -1GHz

Detector: QP mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 1GHz -3GHz

Detector: Av mode and PK mode

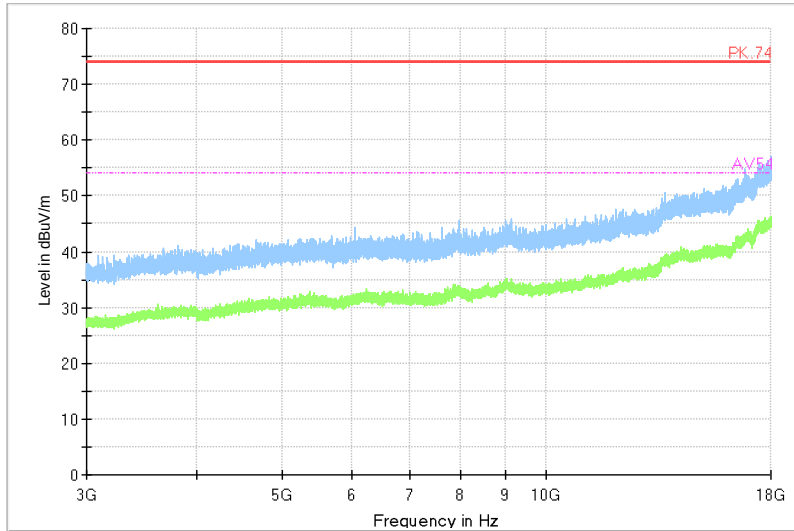
Modulation type: 802.11 ax(HE20)



BUREAU
VERITAS

Test Report No.: PSU-NQN2504150110RF07

Full Spectrum

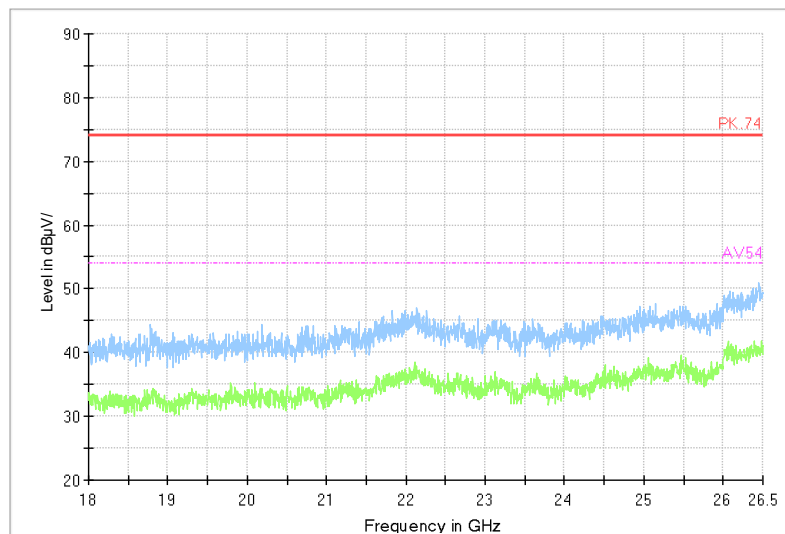


Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)

Full Spectrum



Frequency Range: 18GHz -26GHz

Detector: Av mode and PK mode

Modulation type: 802.11 ax(HE20)



3.3 6 dB BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

3.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	R&S	ESW 44	101973	Mar.28,24	Mar.27,26
Open Switch and Control Unit	R&S	OSP-B157W8	100836	N/A	N/A
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A03	182185	Mar.29,24	Mar.28,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Hygrothermograph	DELI	20210528	SZ015	Sep.06,25	Sep.05,27
PC	LENOVO	E14	HRSW0024	N/A	N/A
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,25	Apr.26,26
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,25	Apr.26,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26
Power Meter	R&S	NRX	102380	Mar.28,24	Mar.27,26
Power Meter probe	R&S	NRP6A	102942	Mar.28,24	Mar.27,26

NOTE:

1. The calibration interval of the above test instruments is 12/ 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in RF Oven room.



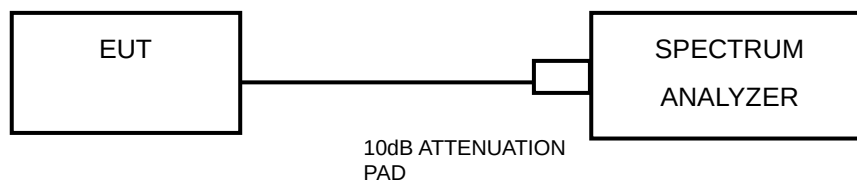
3.3.3 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.3.4 DEVIATION FROM TEST STANDARD

No deviation.

3.3.5 TEST SETUP



3.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.3.7 TEST RESULTS

Please Refer to Appendix1/2 Of this test report.

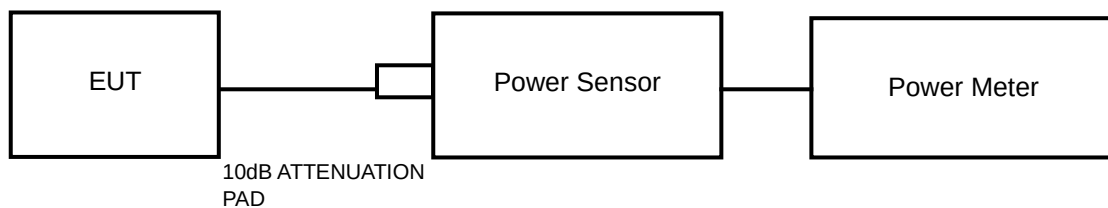


3.4 CONDUCTED OUTPUT POWER

3.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

3.4.2 TEST SETUP



3.4.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

3.4.5 DEVIATION FROM TEST STANDARD

No deviation.

3.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.4.7 TEST RESULTS

3.4.7.1 MAXIMUM PEAK OUTPUT POWER

Please Refer to Appendix1/2 Of this test report.



3.4.7.2 AVERAGE OUTPUT POWER (FOR REFERENCE)

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

Please Refer to Appendix1/2 Of this test report.

3.5 POWER SPECTRAL DENSITY MEASUREMENT

3.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm/3KHz.

3.5.2 TEST SETUP



3.5.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.5.4 TEST PROCEDURE

1. Set the span to 1.5 times the DTS bandwidth
2. Set the RBW = 3 kHz, VBW $\geq 3 \times$ RBW, Detector = peak.
3. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.5.5 DEVIATION FROM TEST STANDARD

No deviation.



3.5.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.5.7 TEST RESULTS

Please Refer to Appendix1/2 Of this test report.

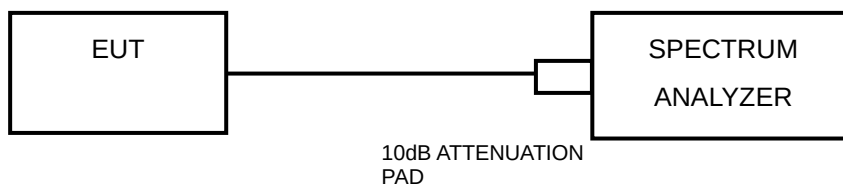


3.6 OUT OF BAND EMISSION MEASUREMENT

3.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

3.6.2 TEST SETUP



3.6.3 TEST INSTRUMENTS

Refer to section 3.3.2 to get information of above instrument.

3.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 300 kHz.
3. Set span to encompass the spectrum to be examined
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

3.6.5 DEVIATION FROM TEST STANDARD

No deviation.

3.6.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

3.6.7 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level. D2 line indicates the 20dB offset below D1. It shows compliance to the requirement.

Please Refer to Appendix1/2 Of this test report.



3.7 ANTENNA REQUIREMENTS

3.7.1 STANDARD APPLICABLE

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.7.2 ANTENNA CONNECTED CONSTRUCTION

An embedded-in antenna design is used.

3.7.3 ANTENNA GAIN

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = $10 \log(N_{ANT} / N_{ss})$ dB;

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for $N_{ANT} \leq 4$;

The EUT supports Cyclic Delay Diversity (CDD) mode,

For power measurements, the directional GANT is set equal to the antenna having the highest gain as following formulas.

Directional Gain = Max.Gain + Array Gain.

For PSD measurements, the directional GANT is calculation is following F)2)f)ii of KDB 662911 D01 v02r01.

The directional gain is calculated as following table.

2.4GHz	Ant 4 (dBi)	Ant 8 (dBi)	DG For Power (dBi)	DG For PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	-3.2	0.4	-1.04	-1.04	0.00	0.00

NOTE :DG= directional gain, Power Limit Reduction = DG For Power Gain -6dBi<0

PSD Limit Reduction = DG For PSD - 6dBi<0. Therefore, it is not necessary to reduce maximum peak output power and PSD limit.



4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.



6 APPENDIX 1

WLAN 2.4G

Duty Cycle

Modulation Type	Frequency (MHz)	Antenna	Plot	Duty Cycle	Correction Factor(dB)
802.11b	2412	Ant8	Fig.1	99.35%	0
802.11b	2412	Ant4	Fig.2	99.34%	0
802.11g	2412	Ant8	Fig.3	99.67%	0
802.11g	2412	Ant4	Fig.4	99.67%	0
802.11n HT20	2412	Ant8	Fig.5	99.87%	0
802.11n HT20	2412	Ant4	Fig.6	99.89%	0
802.11ax HE20	2412	Ant8	Fig.7	90.67%	0.43
802.11ax HE20	2412	Ant4	Fig.8	97.66%	0.10
802.11be HE20	2412	Ant8	Fig.9	97.27%	0.12
802.11be HE20	2412	Ant4	Fig.10	97.44%	0.11
802.11n HT40	2422	Ant8	Fig.11	99.85%	0
802.11n HT40	2422	Ant4	Fig.12	99.86%	0
802.11ax HE40	2422	Ant8	Fig.13	97.73%	0.10
802.11ax HE40	2422	Ant4	Fig.14	97.71%	0.10
802.11be HE40	2422	Ant8	Fig.15	98.10%	0
802.11be HE40	2422	Ant4	Fig.16	98.09%	0

Note: Correction Factor=10*log (1/Duty Cycle)



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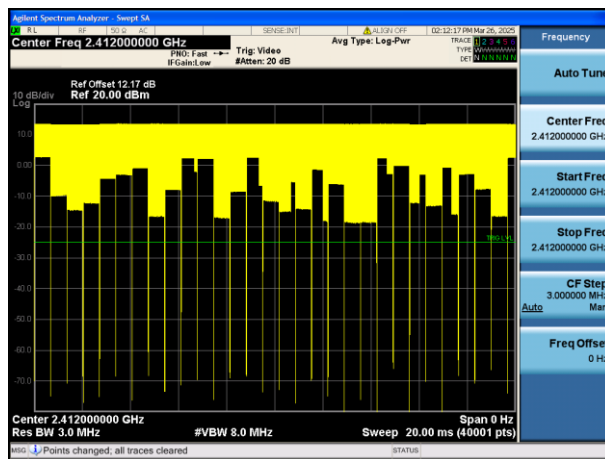


Fig.1

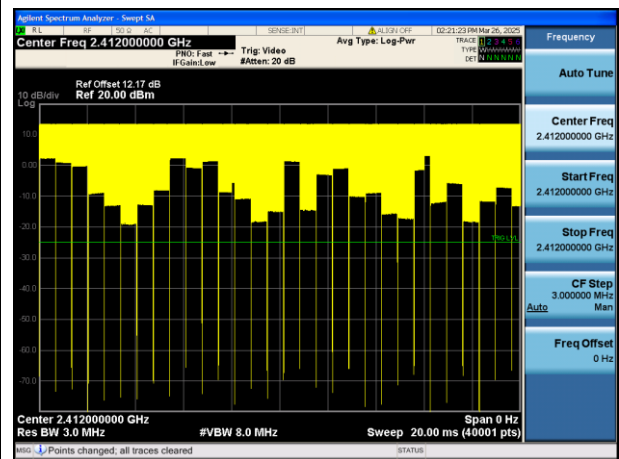


Fig.2

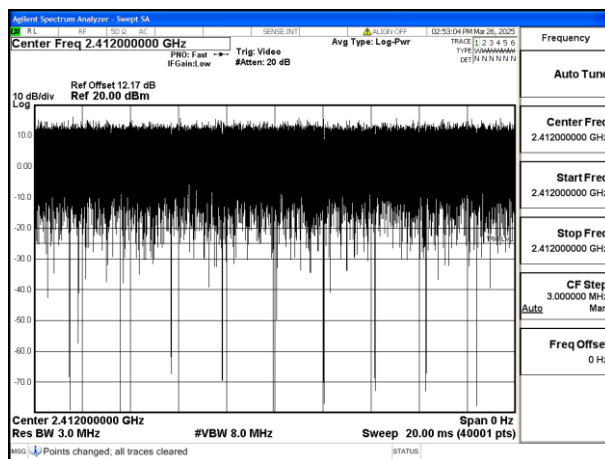


Fig.3

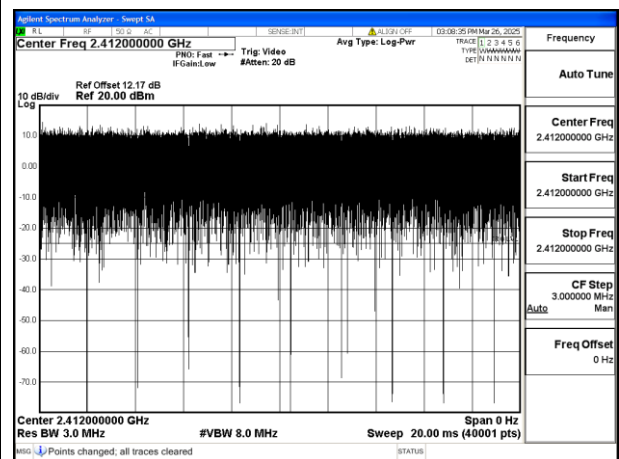


Fig.4

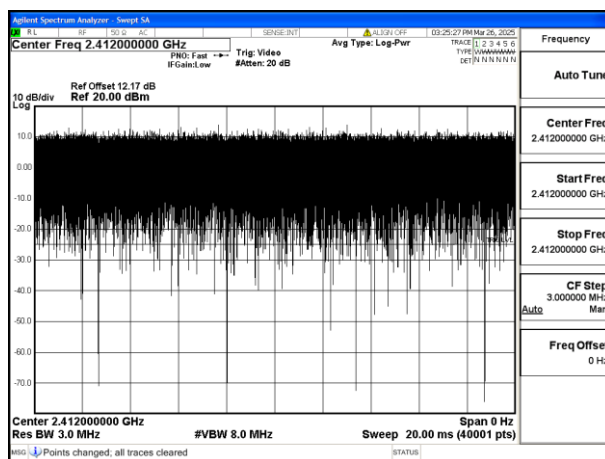


Fig.5

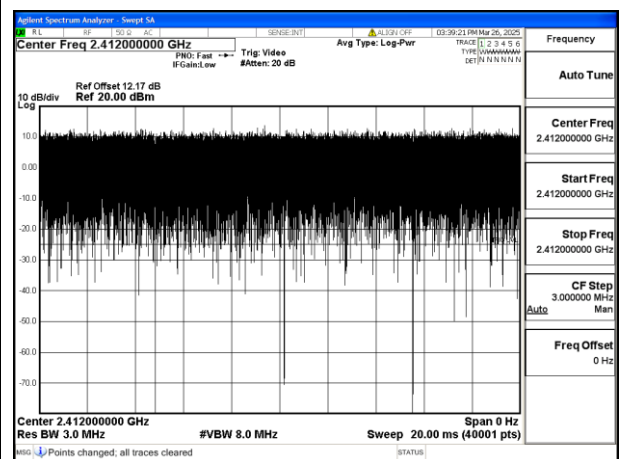


Fig.6